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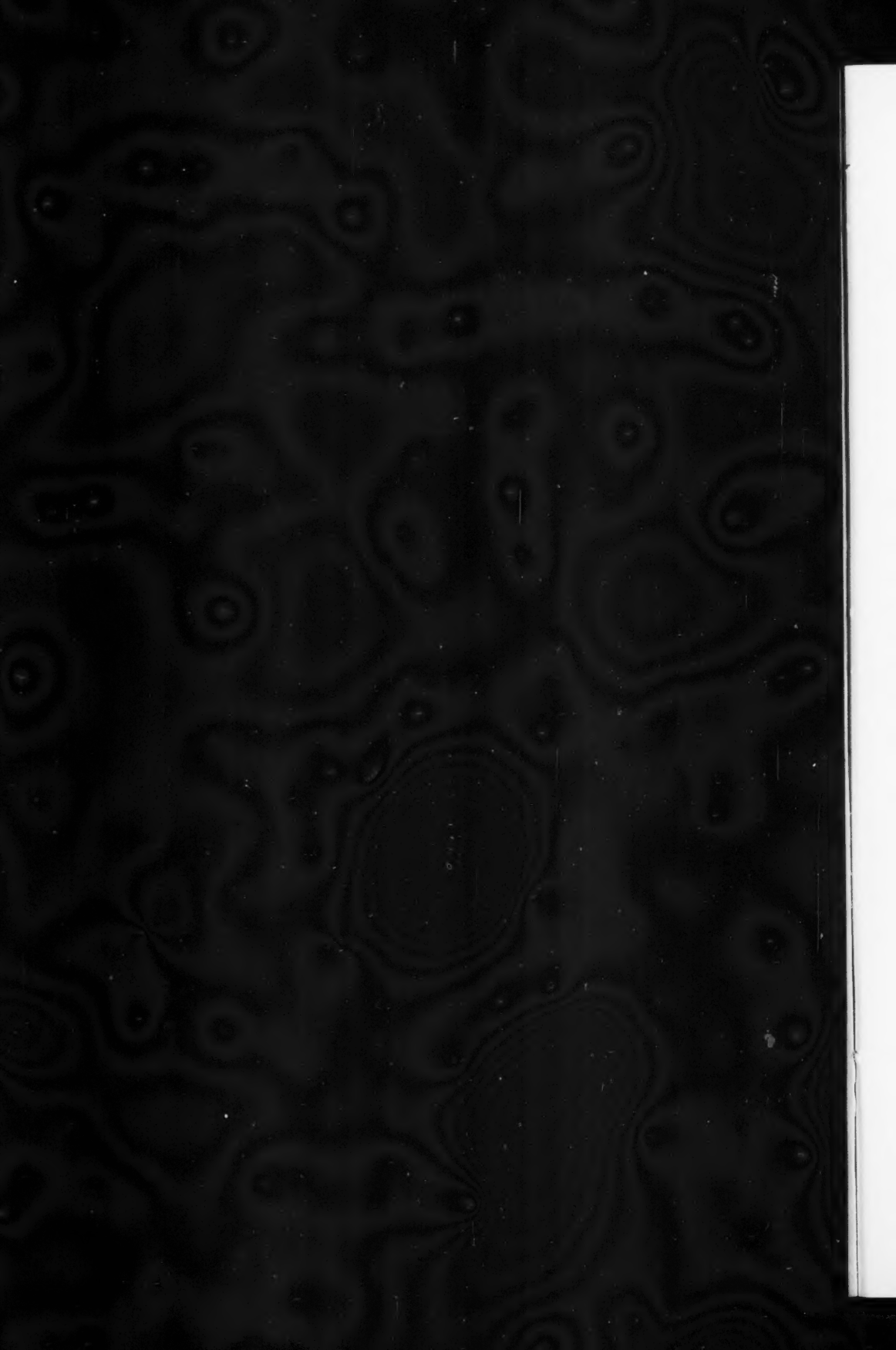
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McFarland

Penstemon unilateralis

Introducing the Penstemons

GRACE F. BABB

Are you growing Penstemons in your garden? Have you heard or read very much about them? Well, never mind, lots of other good gardeners never have, either. And yet they are one of our loveliest wild flower families. Their only common name is Beard-tongue, and the botanical name *Penstemon* means "fifth stamen," both of which names refer to a very unusual part, a stamen (one of five) which is sterile. It has no anthers and carries no pollen, but it is often bearded with golden hairs, making a conspicuous "tongue" in the throat of the blossom.

The Penstemons are an immense family with well over 200 members, some very similar and closely related, others varying tremendously, but all displaying the sterile stamen and the unusually sharp-pointed seedpods which distinguish them. They are one branch of the large Figwort Family which includes the foxgloves and other well-known garden plants. Most of our present knowledge and understanding of Penstemons, and their natural botanical groups, comes from the long work of two outstanding authorities, Dr. Francis W. Pennell and Dr. David D. Keck, both of whom have published many papers and keys concerning Penstemons.

This is a fascinating group to collect and study for many reasons. Many of them blossom in midsummer or later, making them very worthwhile to carry on color through the garden's duller season. They offer plants suitable for almost any garden condition or climate, with proper selection, since they grow wild in all sorts of situations from the east coast to the west, and from Mexico up into Alaska. They are found on

cool mountain tops and on sun-baked plains, in low sunny meadows and in high shaded canyons, along moist river banks and even in dry sand banks along the roads. (In fact, the banks along new road cuts are among their favorite haunts.) In size and color, the possibilities are almost unlimited. There are leafy clumps, tall slender spikes, evergreen shrubs, and low alpine. The colors include the whole range from white and pale yellow through pink and brilliant reds to lavender, purple and clear blue.

The story of flower evolution, so slowly discovered and proved through the past hundred years, is well illustrated in this one family, and makes them the more interesting to the curious gardener. The most important function of all flowers is to attract insects to the mature blossoms so that the all-important pollen may be carried from one flower to another, insuring cross-fertilization. Every beautiful and intricate flower has some reason for its complex make-up, and Penstemons have evolved many "tricks of the trade." The usual shape is a long-throated, two-lipped trumpet, often wide-mouthed and bell-shaped, with nectar secreted at the back of the throat, and the pollen on long stamens which are curled into the top of the flower. The pistil, held in the center, matures later than the anthers in the individual flower, thus the pollen, dusted on the face and back of visiting insects, will not fertilize that blossom but be carried to some earlier-maturing flower. The single sterile stamen curves down into the bottom of the flower, forming an easy landing place for insects.

The simplest blossoms are plain colored, white or yellow or pale lavender, with wide-open throats easy of access to the insects, and often lined with deeper-toned stripes which serve as guide-lines to the nectar. A few species have such extremely large flowers that even bumblebees may crawl in easily. A few others have extremely narrow throats, entirely closed by a ridge of the lower lip; the lip projects conveniently like a platform for the bees, and their weight on the lip opens the throat to let them enter. It is interesting to note that while the large open blossoms usually have smooth sterile stamens, those of the narrow flowers are thickly bearded to help the bees alight. At the opposite extreme in size are several species with flowers so tiny that they are thickly clustered into rounded heads like mint blossoms.

A few species have developed very sticky-hairy stems and flowers to discourage small crawling and flying insects, while their white or light-colored blossoms with extremely long nectar tubes are designed to attract the night moths which fly only after dark. One distinctive species, *P. ambiguus*, is hardly to be recognized for a Penstemon with its petals flattened around the long slender tube of nectar, making a perfect feast-table for butterflies attracted to its pale pink and white blossoms.

Throughout the West are many gorgeous scarlet and red blossoms with very long straight tubes which attract a still different clientele, the brilliant humming-birds which hover in mid-air to sip the nectar, but are nearly as efficient as insects for transferring the pollen. Other Penstemons, particularly through the midwest, have attained a nearly true blue color, the rarest in nature and perhaps the most sought-after by gardeners. Blue appears to be

the ultimate aim of color evolution, since it is the favorite color of the bees, our most important plant allies. Many of these sky-blue Penstemons show their evolution from red to blue in their pink stems and buds, and rose-shaded blossoms, while other dark blue and purple blossoms are often red-tinged or lined with magenta.

Penstemon foliage varies as widely as the colors, showing the adaptation of the species to their environments. Plants of moist or partially shaded locations usually make leafy green clumps, while those of the dry midwest plains often have basal rosettes and slender stems with fewer leaves, and often blue-gray or silvery with a waxy-coated surface (called glaucous) which prevents the precious moisture from evaporating too rapidly in the heat. In the high mountain ranges, the plants become dwarfed and evergreen, making low spreading shrubs or completely prostrate mats of tiny leaves with amazingly large blossoms held close above the foliage. A few species along the west coast have become vines. The leaf-patterns, too, may be long and strap-like or heart-shaped and deeply toothed, lance-shaped or round, narrowly linear and grass-like, or even finely cut as ferns in one species, *P. dissectus*. These wide variations of all kinds play an important part in sorting the species into botanical groups.

Do you wonder why these fascinating plants are so little known? They have long been popular in English gardens, and many are being grown in various parts of this country. Several nurseries which specialize in native plants, and some seedsmen, offer long lists of species. However, plants grown from seed, except from specialists, have too often proved to be wrongly named and often commonplace, with a few easily grown species masquerading under

many other names. This is usually no fault of the dealer who buys seed from too widely-spread sources to be readily checked. Plants too have been disappointing because of their lack of hardiness or biennial habits. The newer hybrids, such as Garnet and Firebird which are quite widely offered, are forms of Mexican or Californian species which cannot be expected to be winter-hardy in colder parts of the country. Even thoroughly hardy and properly named plants may have been wrongly chosen for new homes, and may refuse to thrive under those particular conditions. This last point cannot be emphasized too strongly, since Penstemons are still for the most part "wild flowers," and very temperamental if growing conditions do not satisfy their wants. It is often helpful to know where your chosen species grow wild, although it is not always practical or necessary to attempt to duplicate those conditions. The weather, too, apparently has a great influence on Penstemons, seeming to determine whether or not certain species will bloom, whether the colors shall be good blues or less lovely red-purples, and whether they will continue to make new growth after blooming. Some species, and even individual plants, however, seem to be highly resistant to such factors as soil and weather, giving promise of valuable new races in the future. But all these things have kept Penstemons from becoming well-known and popular with the average gardener.

Perhaps the surest way to enjoy Penstemons is to grow a variety of species each year from seed, with the assurance that probably some of the plants will be pleased with the weather and your garden, and provide you with a thrilling display. Seedlings are fascinating in themselves since they show as wide a range in size and shape and

texture as do the mature plants. The first seedling leaves are often quite different from the stem-leaves of blooming plants. Colors vary from dark to bright green, and from blue-green to gray-green or silvery gray, while some have noticeable red tints on stems and under-leaf surfaces. The first summer's growth may be neat sedum-like rosettes, slender wiry stems with few leaves, or strong leafy clumps. This foliage is in most cases completely evergreen over winter, often showing luscious red, wine, or maroon shades, while the gray glaucous rosettes are usually tinted with rose and lavender.

Any successful method of seed sowing seems to be equally successful with Penstemons. Many species, especially the shrubby kinds, need a period of freezing, but others, such as *P. cobaea* and *barbatus* from warm regions, will germinate quickly with no freezing. Most plants will throw up bloom stalks the second summer, if growth has been strong and steady. This is the most critical period, usually, since with many species, the whole blooming stalk and basal foliage dies down as the flowers fade, sometimes even before ripening seed. However, when growing conditions are satisfactory, new basal growth appears quite quickly, and remains evergreen in turn until the following summer. Prompt care in the way of food and water immediately following bloom, and the removal of all or some of the seedpods, will often turn the trick of keeping Penstemons perennial instead of biennial.

All too few of these lovely flowers are to be found in gardens and catalogues, and yet the regional reports which follow, gathered from members of the American Penstemon Society in all parts of the country, are filled with fascinating notes and cultural tips about Penstemons, both rare and com-

*McFarland**Penstemon hirsutus*



McFarland

Penstemon hirsutus — detail

monplace, that are actually growing in the members' gardens. These notes are sure to intrigue the inquisitive gardener, and yet they may also confuse, by "sheer weight of numbers." Perhaps some short notes here about the species most easily found in plant and seed lists will be helpful.

One of the best-known is undoubtedly the Shell-leaf Penstemon, *P. grandiflorus*, with beautiful waxy pale green leaves and three-foot stems of immense pale lavender "foxglove" blossoms. Pink and white varieties are also to be found, and a new race of hybrids is being developed with a wide range of glorious colors. Almost equally well-known as a border plant is *P. digitalis* with phlox-like clusters of large white or pale lavender flowers and tall leafy clumps of foliage. This species may appear under many other names, especially when Penstemons are grown from seed. Another masquerader sold under many different names is *P. hirsutus* (pubescens). It is much less showy, but its graceful arching stems are hung with lavender, white-lipped tubes which make up in numbers for their lack of brilliant color. Richer shades of purple and bright pink, much lovelier than the wild forms, have been developed in recent years by Mrs. J. Norman Henry as the *Gladwyne* varieties.

P. ovatus is another very dependable species, popular country-wide, with handsome almost evergreen basal rosettes, and bright blue flowers clustered into close panicles along the 18-inch stems. The Firecracker Penstemons, *P. barbatus* and *torreyi*, sometimes listed as *Chelone*, are also very widespread in cultivation, along with several named forms. Their stems may be long, lax, and floppy, but their pretty tubes of scarlet, rose, or plum-purple are long in bloom, and especially valuable for their midsummer bloom when most

other species are past and forgotten.

P. unilateralis is always popular in the border, with tall one-sided spikes of bells ranging in color from lavender to purple or rose, with opalescent shadings. Closely related are the handsome *PP. glaber*, *brandegei*, and *alpinus*, all at their best in their native midwestern states. *P. glaber* has tall slender stems of dark blue bells, and *brandegei* is also tall with close-packed bright blue trumpets often tinged with rose, while *alpinus* is more compact, only about 8 inches tall with lovely blue flowers, a fine rock garden plant. The first two, like *barbatus*, are inclined to be weak-stemmed and floppy in warm moist climates or in excessively wet weather, unless staked, but like most tall Penstemons are immensely valuable for cut flowers as well as border planting.

In warm dry gardens of the South and Far West, the tall and handsome *P. spectabilis*, varying from purple to rose, —*palmeri* in pink and white, —*lactus* in soft lavender-blue, —and *cobaea* with immense gloxinia-like bells of lavender and purple, —are especially satisfactory. The Californian *P. heterophyllus* and its variety *purdyi* are grown in many parts of the country as annuals for their masses of metallic blue flowers. *P. hartwegi* and the *gloxinioides* hybrids are also much used as annual bedding plants. Gardeners with a long growing season are most successful with these species from warm regions.

Many other species are best suited to the rock garden to display their special charms. Most tantalizing, and most beloved perhaps, are *P. nitidus* and *angustifolius*, related to the Shell-leaf Penstemon, with lovely gray foliage and stems of pink buds opening to clear sky-blue at their best, or sometimes tinted with rose and almost as lovely. These two do best in their native midwest, but are reasonably successful in

many other regions. Entirely different but also popular are *P. procerns* and *albertinus* (*caelestinus*) with neat green basal mats and slender stems of dark blue flowers in mint-like clusters. *P. tolmiei* and *aridus* are related miniatures, only a few inches tall, *aridus* with fine gray foliage, both with bright blue flower clusters, while *P. humilis* and *virens*, often confused in cultivation, have more open sprays of blue.

Many fine evergreen shrub species are listed in rock garden catalogues, all lovely and desirable. *P. scouleri* and *fruticosus* are taller kinds with foot-high clumps of gray-green foliage and short-stemmed spikes of huge lavender and purple trumpets. *P. cardwelli* is more bushy with darker green foliage and generous spikes of purple-blue. *P. menziesi* and others of its group are creeping, following every contour of the ground and rocks, and displaying

equally lovely blooms. *P. rupicola* is probably the goal of all rock gardeners (and one of the hardest to tame), clad in silver-gray foliage and rich rosy-red flowers. *P. crandalli*, in contrast, is perhaps one of the easiest in most gardens, with more open mats of gray-green foliage decorated with short blue bouquets. Even more choice varieties in pink and pure white may be found of many of the shrubby Penstemons.

These comparatively few descriptions are no more than "appetizers" to tempt your interest. The regional reports will help you choose the most satisfactory species for your own garden—but for real adventure, try all the kinds you can get your hands on. Flower lovers who have once seen Penstemons in bloom in their native haunts, or who have grown and flowered them successfully in their gardens, are Penstemon enthusiasts forever!



Sylvia Saunders

Penstemon serrulatus at Foxden, Peckskill, N. Y.

On the Systematics of Penstemon

FRANCIS W. PENNELL

A systematic appraisal of a genus considers primarily its relationship with other genera and its division within itself ultimately into species and their subdivisions. We wish, too, to develop the picture of the distribution of the genus and of its species over the earth. Also, so far as may be possible, we wish to discover the direction of evolution within the group, to develop a real phylogeny that can reveal what is relatively primitive and what of later appearance.

Penstemon belongs to the Scrophulariaceae, one of the later-developed families of flowering plants. Its great genera, *Calceolaria* in South America, *Pedicularis* in Eurasia, *Penstemon* in North America, all numbering their species by the hundreds, are significantly absent in old relic floras, but dominate in the vast territories, such as western North and South Americas, that have developed their life since mid-Cenozoic times. Alas, the lack of fossil records of families of herbaceous flowering plants precludes actual evidence of such late origin for these three genera, but their recent deployment into many species (a process that must be still in actual progress) shows them to be most highly adapted to growing conditions on the earth today.

RELATIONSHIP OF PENSTEMON TO CHELONE

Only with *Chelone*, the turtlehead genus of eastern North America, is *Penstemon* closely inter-related. Two centuries have hardly proved the distinctness of these two genera. *Chelone* was described in 1706 by Tournefort, from material brought from Acadia; and by Linnaeus in 1753 it was named *C. glabra*. This was in the "Species

Plantarum," the work that first developed the binomial system of nomenclature.

It was in 1741 that John Mitchell, an English physician who had resided in Virginia, brought out a paper entitled "Plantarum quaedam Genera recens condita et in Virginia observata" (Certain genera recently erected and observed in Virginia); among the 30 new genera was *Penstemon*.¹ After the manner of Linnaeus' "Genera Plantarum" only the reproductive structures were considered. These were the calyx, corolla, stamens, pistil, and capsule, while between corolla and stamens was noted a filament that is long, style-like, grown into the corolla-tube, villose on its upper side, of the length of the corolla, and about which Mitchell asked "Cui usui?" (to what use?). Twelve years later, in his "Species Plantarum" of 1753, Linnaeus made Mitchell's *Penstemon* his *Chelone penstemon*, placing it and its hairy relative *C. hirsuta* with *C. glabra*.

One can not wonder that Linnaeus merged *Chelone* and *Penstemon*. The flowers, though distinguishable, are structurally so alike that we still know them as nearest of kin. In both they are horizontal and two-lipped, and the sterile filament is present and filament-like. But with the reissuance of Mitchell's paper in 1769 (thus placing it also after the beginning of binomial nomenclature in 1753) both names came into vogue again.

Fifty years after Linnaeus' masterpiece, in 1803, came the first comprehensive Flora of this continent, but Michaux' "Flora Boreali-Americana"

¹Recent custom, in dropping "t" from the first syllable, is simply returning to Mitchell's original spelling, a course permissible for euphony.

in recognizing as distinct the genus *Penstemon*² had in it only the two species of Linnaeus. But Pursh's "Flora Americae Septentrionalis" of 1814 had seven species, four from the Missouri Valley and collected by Bradbury (these being the first from the territory that was to prove so prolific of this genus). Pursh contrasted the genera thus: *Chelone* by having its fifth and sterile filament shorter than the others, and its seeds with membranaceous margins; and *Penstemon* by its sterile filament being longer than the others and bearded on the upper surface, and its seeds subglobose. In 1818 Nuttall in his "Genera of North American Plants" maintained both genera, *Chelone* with 3 and *Penstemon* with 9 species, and added a further contrast: that in *Chelone* the anthers were lanuginous, but smooth in *Penstemon*. About the latter he gave comment and forecast: "A North American genus and probably an extensive one." But, also in 1818, the German botanist, Kunth, publishing on the Mexican collections of Humboldt and Bonpland, called all his five species *Chelone*, although two of them had the sterile filament glabrous while three had it bearded.

No later writer has maintained *Chelone* for the entire association of species, although point by point the supposed distinguishing characters have broken down. By 1878 Asa Gray (in his "Synoptical Flora of North America") separated the two only by the seeds, *Chelone* bearing "seeds surrounded by a broad membranaceous wing" and *Penstemon* "seeds angulate, marginless." His treatment assigned 4 species to *Chelone*, 3 similar eastern ones and one habitually unlike northwestern one constituting the section *Nothochelone*. To *Penstemon* he as-

signed 71 species and many varieties, a number raised in his second edition of 1886 to 82 species. These were mostly from the western United States, and proved *Penstemon* to be one of the large endemic genera of this continent.

Dr. David D. Keck and I now propose to delete from the contrast between *Chelone* and *Penstemon* the only character that Gray left there, for it seems to us that *Chelone nemorosa* is too like *Penstemon lyallii* to be placed in a different genus; rather it seems to us that the winging of the seeds of what we call *P. nemorosus* is a special stage beyond the somewhat flattened seeds of *P. lyallii*, and not an evidence of actual kinship with true *Chelone* of the East.

Taken together *Chelone* and *Penstemon* form a single racial association. They are perennial herbs, or sometimes in *Penstemon* shrubs. The leaves, always opposite, may be uniform, or in many species of *Penstemon* dimorphic. The inflorescence may be simple, or usually in *Penstemon* compound. The sepals are indistinguishable. The corolla may present many forms in *Penstemon*, usually with throat open, but in occasional species the orifice may be closed until the weight of an insect-visitor depresses the palate; in *Chelone* the corolla is shortened and always of the latter type. The sterile filament is slender, and in both genera may be either glabrous or bearded, though in *Chelone* only obscurely so. The fertile anthers may be glabrous or hairy in *Penstemon*, in one subgenus and a few ultimate species of another section being densely lanuginous (or spreading-woolly); in *Chelone* they are always of the latter type. The capsules are alike. The seeds in *Penstemon* are turgid and sharply angled, though they are occasionally somewhat flattened and in one species (*P. nemorosus*) even wing-

²In works of the nineteenth century uniformly spelled "Pentstemon."

marginated; in *Chelone* they are wholly flattened and radially winged. On such evidence must we restore all of this group to *Chelone*?

Such a combined genus would have an excellent positive character in the development of the sterile filament. In horizontal two-lipped flowers, those especially adapted to the visits of bees as are most Scrophulariaceae, the uppermost stamen (which is on the median line of the flower) usually atrophies and disappears, while the others become of two lengths, an upper shorter and a lower longer pair. But uniquely in *Chelone* and *Penstemon*, while this uppermost stamen loses its anther and becomes functionless in reproduction, its filament persists and undergoes evolution into a new structure that either develops a specially dense beard or an enlarged club-like or knob-like apex. In reply to Mitchell's question "Cui usui?" I suggest that this assists in pollination by giving the visiting bee an additional holdfast to which to cling in entering the corolla bent down with her weight. In *Penstemon* this sterile filament is usually conspicuous or variously modified, although it may remain as but a rudimentary filamentose structure; in *Chelone* it is always the latter, even if somewhat bearded. But the presence of this sterile filament, whether functional or as a rudiment, marks this as a most natural association of plants.

Were we to combine *Penstemon* and *Chelone*, by priority the name for the enlarged genus would be *Chelone*. Or should we be influenced by the vast number of species involved, and therefore conserve *Penstemon*? Before so doing, let us once again consider whether there are not characters, other than those used in the past, that can distinguish the two groups.

Structurally, we note a difference in

the inflorescence. In *Chelone* this is a spike, in which each of the crowded flowers bears rounded sepals and is subtended by a pair of sepal-like bracteoles. In *Penstemon* the inflorescence is looser, a raceme or a panicle; its pedicels are evident, and bracteoles are not sepaloid; or more usually the inflorescence is compound and thyrsoid. Also there is a difference in flowering time: *Chelone*, which occurs in the long-seasoned East, waits until autumn to flower, while *Penstemon* flowers in early summer (which may not be until midsummer at high altitudes), although the wing-seeded *P. nemorosus* pertains to late summer. On these characters I think that both genera may be continued, though with the realization that *Chelone* is but an offshoot of a vast association of species that we mostly place under *Penstemon*.

PRESENT STATUS OF CHELONE

As now understood *Chelone* comprises 4 species, all of the eastern United States and most diversified in the Appalachian highland, where sharp specific or subspecific limits are difficult to establish. Its flowers have a shape that makes the name "turtle-head" most appropriate. In some species the corollas are purple, but *C. glabra* with white corollas is more abundant than these other plants all together. The persistence of dull purple coloration within the corolla (where it is not visible and so subject to natural selection) shows that *C. glabra* must have come from purple-flowered ancestry. The popularity of this species with bumblebees is evident any September day, the bees crawling within the corolla by clinging to the villose hairs that cover the raised palate, and each quite filling the whole corolla.

PRESENT STATUS OF PENSTEMON

By present count *Penstemon* com-

prises 327 species as yet described, while any effort to study it carefully is certain to involve the recognition of many more. For years I have been engaged in its analysis, publishing in 1920 upon Rocky Mountain species, in 1935 upon those of the eastern and central United States, while at present I am preparing an account of those of the western part of our country. My friend, Dr. David D. Keck, long of California but now at the New York Botanical Garden, has also studied various groups, and has recently prepared the text on this genus for Dr. LeRoy Abrams' "Illustrated Flora of the Pacific States." We have both traveled far afield in our studies, but his has been the advantage of living in the territory of great development of the genus and of growing certain species for genetical analysis. My method has been to make field descriptions of the fresh flowers of each kind obtained, but I have lived in the East and only visited the great western territory in 1915, 1931, 1937, 1938, 1940, and 1949. I have made such descriptions of over 250 apparent members of *Penstemon*.

For systematic study *Penstemon* has the merit of falling into sharply marked units; it is more satisfactory to study than its tiny ally *Chelone*. One acquires confidence that its members will run true to the characters distinguished on the representatives studied afield. Hybridism, while existing, is restrained, and rather readily spotted. Mostly its species seem to have resulted from a long course of segregation due to isolation in nature. Both Dr. Keck and I are lured by the desire to map the ranges of these species, some of which will occur over considerable territory while others occur only at a given elevation on such a side of a limited mountain range. (In contrast to the relatively wide occurrence of species in the

eastern United States, those of the western part of our country are in great part precisely limited endemics.) Comparing its many species one can attempt to reconstruct in *Penstemon* what must have been the steps of change by which different groups came to be differentiated, or by which present complexity has developed from a simpler past.

First, let us see the outstanding methods of pollination in *Penstemon*. The high differentiation of this genus lies in the flower, and that is actually an organ with function to bring about the transfer of pollen from individual to individual. The basic method of pollen-transfer in the Scrophulariaceae is by bees, and such is very evidently the case in *Penstemon*. Within this group there must be much diversity in the agents, judging by the differences in the size and colors of the corollas. *P. grandiflorus* and *P. cobaea* must require enormous bees, compared to such as visit *P. angustiflorus* and *P. globosus* or such little flowers as are offered by *P. procerus* or *P. telmici* with violet-blue, or *P. confertus* or *P. ochroleucus* with yellowish flowers. Such refinements of knowledge as to the special visitors of each species must await the future, but may the day hasten when we realize that information as to how a flower works is essential in explaining its structure!

Other methods of pollination in *Penstemon*, as throughout the Scrophulariaceae, have developed from the background of bee-pollination. Nearest like it is pollination by hovering moths, such as I have seen in *P. albidus* in Nebraska and North Dakota, and which must also occur in *P. deustus* and *P. tubaeiflorus*. These flowers are alike in differing from their nearest bee-pollinated kindred, by having the corolla-throat too narrow to easily

admit a bee and in having the surface of both throat and limb glandular-sticky so as to repel these ancestral visitors. *P. albidus* is of the kinship of *P. eriantherus*, *P. tubaeiflorus* of that of *P. digitalis*, but *P. deustus*, with its sharply cut leaves, seems to be of more isolated lineage. These species all bear white flowers that bid for moths that fly at dusk, although I have also seen *P. albidus* visited by other moths flying about noon. (There are also *Penstemon*s with red corollas glandular within, of which the pollination is as yet unknown.)

A very specialized method of pollination in *Penstemon* is that of the Phlox-like pale purple or white flowers of *P. ambiguus*, the slender curved tubes of which could only be penetrated by butterflies' tongues, while the ample spreading limbs offer these insects excellent standing space.

But most frequent of the departures from bee-pollination in *Penstemon* is that shown by those species of various groups which have developed stout red tubes, accessible to the bills of hummingbirds. Repeatedly and independently have such flowers arisen, as in *P. centranthifolius* (Scarlet Bugler), *P. catonii*, *P. barbatus*, *P. murrayanus*, *P. bridgesi*, and *P. rupicola*; and among tall-growing Californian species *P. cordifolius*, *P. corymbosus*, and *P. ternatus*. Just as would be expected from hummingbirds being geologically so much later than bees, these flowers must all have arisen from bee-pollinated ancestry.

What other criteria have we in *Penstemon* as to what is primitive and what is advanced? I suspect that the morphology of the foliage is significant. In a group of woody species in California the leaves are uniform and indefinitely repeated on the long stems. Such are *Penstemon lemmoni*, *P. brev-*

iflorus, and *P. antirrhinoides* with two-lipped yellowish or yellow bee-pollinated flowers, the plants being widely and densely branched bushes; because it shares this habit, I suspect that it is from such species that the butterfly-pollinated *P. ambiguus* of the Colorado Valley has been derived.

In contrast the leaves of most species of *Penstemon* are dimorphic. Although perennial, these plants are presumably shorter-lived. These are the species so numerous across North America, the subgroupings of which will be discussed when we consider flower-structure. The basal and lower leaf-blades, especially where taking part in winter-rosettes, are wider and petioled, the upper narrower and sessile. Such are plants of the Graciles (*Spermunculus*), Cristati (*Aurator*), Glabri, and Coerulei. In the southeastern United States an extreme example of such dimorphism is *P. dissectus*, of which the rosette leaves are merely crenate, but the cauline ones are pinnatifid-dissected.

In seeds, reasoning from analogy with other groups and from the fact that large seeds (up to 2-3 mm. long) characterize the surely advanced groups of the Cristati, Glabri, and Coerulei, I consider that the small seeds (1 mm. long) of *Spermunculus* and of *P. lemmoni* and *P. breviflorus* are relatively primitive. Evolution has been from small to large seeds.

In corolla the chief cleavage is into species that show this two-ridged internally on the ventral side as against those that have the ventral side simply rounded. Presumably the latter is the derived and so later condition, but both must be of long standing.

Of corollas sharply two-ridged within there are at least three groups. Two of these bear uniform leaves. Of these one is a group of much-branched woody plants that constitutes the sub-

genus *Dasanthera*, of which *Penstemon fruticosus* is the most typical species. These plants have large lavender-violet or purple tubular-campanulate corollas, lanuginous anthers and rather rudimentary sterile filament both as in *Chelone*, but seeds that are turgid and sharply angled as in true *Penstemon*. In contrast with the latter is the simplification of the inflorescence, this forming a simple raceme, except for the irregular development of a pair of small bracteoles. One species, *P. rupicola*, has developed typical elongated red tubular corollas for hummingbird visitors. This is a group of the western, and especially the northwestern United States.

Close to this group and also with uniform leaves, but forming much taller plants that bear compound inflorescences as in true *Penstemon*, is the section *Nothochelone* under which I associate two species, *P. lyallii* with narrower leaves and unwinged though slightly flattened seeds, and *P. nemorosus* with wider leaves and clearly winged seeds. As in *Dasanthera* the flowers of these species are singularly long and sharply ridged within.

The largest single subgroup of *Penstemon* is that which Keck has named *Spermunculus*, in allusion to its small seeds. Its plants tend to be shrubby or subshrubby and somewhat diffuse at base, although many are herbaceous and simply erect. They are low-growing. Its leaves are dimorphic, and usually show a winter-rosette (though in a few species such as *P. radicosus*, *P. watsoni*, and *P. laxus* this may become lost). Its inflorescence is a narrow panicle called a thyrsus. Its sterile filament is usually evident and bearded. Its sepals tend to be scarious-margined, and the margin often curiously cut. The corollas are usually violet-blue, more rarely purplish, or even pale yellow; they are of moderate or more often of

small size and presumably cater to proportionally small bees. The group occurs abundantly throughout the western United States, and some species northward through western Canada.

Turning to species with corollas rounded anteriorly, we have already considered those with elongated stems, uniform leaves, and small seeds (*Penstemon lemmoni*, *P. breviflorus*, etc.). The remaining species all show dimorphic foliage and large seeds. Among these I distinguish four main groups, which I shall introduce by mention of some characteristic species.

Penstemon palmeri and its kindred *Peltanthera* have glaucous and usually wide leaves that are usually sharply toothed or serrate, corollas that are often conspicuously inflated and large enough to admit entire bumblebees, wide anthers, and sterile filament that is in many species exserted and conspicuously bearded, although in other species it may lack hairs completely. The corolla tends to be purple or white, but may even be violet-blue. The group pertains to the southwestern United States.

*Penstemon eriantherus*³ and its kindred (*Aurator*) have leaves slightly dentate to mostly entire and not glaucous, inflated corollas of diverse sizes and which are externally glandular-pubescent, wide anthers, and sterile filament that is characteristically exserted

³By a blunder which our present Rules of Nomenclature forbid us to correct, this species with no hairs on its anther received a name that means "wooly-anthered." In 1811 Nuttall and Bradbury were both independently on the Astoria Expedition in the Missouri Valley in the present Dakota, where Nuttall collected a *Penstemon* with hairy anthers, which appeared under this name in "Fraser's Catalogue" in London in 1813. Pursh, then preparing his "Flora Americae Septentrionalis" of 1814, tried to apply this name to a plant of Bradbury's gathering, and thought that Nuttall must have meant this species of our section *Aurator*, since it showed long hairs but which were on the sterile filament, not on an anther. As Nuttall showed in 1818 he had the species that Pursh, overlooking the fine hairs on the anthers, had called *P. glaber*. This correction stood until rules of nomenclature became too rigid to let scientific common sense outweigh them.

and so displays its conspicuous beard of usually long yellow hairs. The species occur from the Missouri valley westward.

Penstemon glaber, *P. alpinus*, *P. speciosus* and their many associates (Glabri) have leaf-blades entire and not glaucous, corollas which are externally glabrous, narrow anthers that differ exceedingly in hairiness and degree of dehiscence, and sterile filament that is included and differs in presence or absence of bearding. The group extends from the Missouri valley of Dakota to the Pacific coast, but is most diversified in the Rocky Mountain states.

Penstemon angustifolius, *P. secundiflorus*, *P. grandiflorus* and their many associates (Coerulei) have glaucous entire leaves, campanulate corollas which are externally glabrous, narrow uniform anthers, and sterile filament that is usually very strongly bearded. The species occur from the Mississippi valley westward across the continent.

Such are some of the dominant and most highly modified groups of *Penstemon*, but a complete study must carry the analysis much farther. There will be many more smaller groups, and we must try to see clearer the evolutionary development of the whole complex and fascinating genus.

One group, the Section *Saccanthera*, illustrates a cross current that suggests a real complication of the problem of expressing actual relationship. These plants, which are perennial herbs that occur from the mountains of Utah westward to the Pacific coast, are distinguished by peculiarly formed anthers that have the shape of horseshoes, two cells dehiscing on their common rounded apex leaving the side-ends of the horseshoes hanging as lateral pouches. One would think that such remarkable anthers could only have evolved once, and yet, as Dr. Keck has pointed out,

resemblance of certain species to certain *Penstemons* of different groups seems to show that parallel evolution must have operated at least three times to bring *Saccanthera* into being. There are several violet-blue species, and one red-flowered one, the former clearly dependent upon bees and the latter upon hummingbirds for their pollination. Among the former, *Penstemon gracilentus* of the Sierra Nevada is very like *P. procerus*, *P. serrulatus* of the Columbia valley like *P. ovatus* and *P. wilcoxii* of the same territory, suggesting that they have arisen from the *Spermunculus* background of those species, while the red-flowered *P. bridgesii* is also like *P. eatoni* of its arid southwestern territory. We must be dealing with cases of parallel evolution, and yet, if the like species had not survived, we should have considered that we had a remarkably distinct and natural group in *Saccanthera*.

Such is a hasty and imperfect view of *Penstemon*, but it is one that shows how great is the problem of working out actual relationships within this assemblage of races. Dr. Keck and I welcome the cooperation of all whom we can interest to procure us interesting collections, well-prepared specimens with good notes of place, soil, and color; and I beg for assistance in collecting the insect visitors of these plants. Use a cyanide bottle and place the specimens between pieces of cotton in special papers, of course most carefully stating upon what species each insect was obtained. In fact, one should always preserve enough of the plant for identification, as in such a critical group as this we can readily be mistaken as to what species our *Penstemon* is.

But on this matter I wish to close with a note of reassurance and encouragement. As we are coming to know each species better, we are finding how

definitely it has a logical area of occurrence. Gradually we are piecing together the pattern of *Penstemon* distribution over the United States, and finding how interesting the task is and how much it can teach us about the developmental history of all our flora.

But we must be patient, for inasmuch as *Penstemon* has seemed to baffle our efforts, just so much more light will it eventually yield. For over and over again our difficulties have been due to the presence of still unknown members of this wonderful genus.

The Story of *Penstemon Nelsonae*

ELOISE NELSON, *Calif.*

Nearly twenty years ago, one June morning I decided to take a short walk before breakfast. Any of you who have lived in the mountains have shared with me the joy of an early morning when the first days of the sun spread a golden glow across the crags and snow patches of the peaks. This was such a morning, and I wanted to walk up a short trail above my home, and find a log or rock where I could sit and watch the sun come along Mt. Angeles in the Olympic Mountains. This was directly behind the town of Port Angeles on the Olympic Peninsula in the state of Washington. I had not gone a hundred yards along the trail when I noticed a lovely sulphur yellow flower, so soft a color that it seemed to be a part of this golden morning. I stopped to look closer as it was not anything I had seen or known. I had not been a gardener long, my botanical knowledge was scanty, and I could not place it even in the family where it belonged.

It was too pretty to leave there, so I went back for a shovel, and planted it in a corner at the foot of my new rock garden which my husband had just built for me. My choice of a place proved a happy one for it grew well and bloomed each year. The lovely dark green foliage, tinged with red on the back, formed a rosette which spread flat on the ground, and the stout stem

was about 14" high, with the yellow flowers in clusters along the upper two-thirds of the stem. There were several smaller plants on the trail, which I left. My plant in the rockery never seeded itself, but each fall new rosettes formed around the old one.

About 1934, Dr. J. William Thompson, who was teaching botany in Tacoma high schools, came to Mt. Angeles on a botanizing trip. Oddly enough it was in June, and walking through the garden (which like the flower had grown), he stopped with an exclamation when we came to the plant which now had five spikes of bloom. "What *Penstemon* is that and where did you get it?" I was glad to know what it was, and told him where I had found it, pointing to the trail. Not quite believing it, I am sure, he said, "Are you sure? There is no native yellow *Penstemon* west of the Cascades in Washington." So we went up the trail, and the three other plants were still there, persisting among the bracken and second-growth fir. This region had been swept over by successive forest fires, and the plants probably represent the remnants of a once abundant species. Dr. Thompson took one for his herbarium, and told me that he would need more material—bloom, root, and seed. The plant sets seed in large quantities in Washington, but

does not in California at sea level. I saved seed that year, and we both planted it but got no plants, although seed sent to a friend in Royston, B. C., germinated readily.

On Christmas Day 1935, I received a copy of "Rhodora" with a page dog-eared, and under the heading of *Penstemon Nelsonae* was a paragraph in Latin. This really was something, for although I had four years of Latin in high school, those days ended in 1918. But curiosity is a great stimulant and I had to know what this was all about. I went to work and gradually found that it was a description of a *Penstemon*, which could only be the one in my garden. Imagine my shock when I turned the page and found a nice description in English. Dr. Thompson had named it for me, and I am grateful indeed for his unselfishness. I had only brought it into the garden because it was pretty, but he recognized its difference and spent over a year observing and working on its identification. Scores of botanists had visited Mt. Angeles and nearly all of them had seen my rock garden of native plants, and how the plant had escaped notice all that time was a mystery. Dr. Pennell came to the garden several years later, saw both the original plants and my own in full bloom, and was completely satisfied this was a new species. It is deposited in the Dudley Herbarium of Stanford, with isotypes in Carnegie Institute, by Keck and Thompson. It belongs in the Graciles section, and its nearest known relative seems to be *P. attenuatus douglasi*. *P. nelsonae* is of larger stature throughout, and is further removed from *P. attenuatus* and other species of the *confertus-procerus* complex by its denticulate leaves. It is the only yellow *Penstemon* west of the Cascades in Washington.

When I came to California, I brought

the plant with me, but the first year it did not bloom, and nearly died. Here we are at sea level and the soil is heavy and water-logged due to heavy winter rains and ocean fogs. I managed to pull one rosette through, and a year later when we moved again, I sent rooted cuttings to Seattle, and to Amel Priest in Iowa, which promptly died. One piece I rooted and carried all over California with me in a trailer home for several months, and when we returned to Orick, I planted it in the yard. The sunshine was very "liquid" that winter, and the plant resented the water-logged clay. Once again I potted it, and in the spring set it out again, mixing the soil with loam and rock chips. It grew well then, bloomed, and in the fall sent up a circle of new rosettes. I took cuttings this time and in the spring of 1950 had four nice plants which bloomed beautifully, one with eight spikes of flowers. Although they put out the usual rosettes, they began to die because in this soil they make only shallow roots instead of the deep ones that take them through drouth. So once again I have potted two of them to save them.

If it was not for the fact that the original plant was never touchy, and thrived in the rock garden for 15 years with no trouble, I might conclude that *P. nelsonae* has a tendency to die out after blooming. A friend in Victoria, B. C., has the original plant I gave him over 15 years ago. I am convinced that my trouble here is due to wrong soil that does not give proper drainage, and to the lack of winter snow to cover it and give a needed period of dormancy. I have sent seed to various robin members but have not heard any results. In August of 1949 I planted a can of the seed. By January nothing had happened, but then came along a flood, and the can was under three feet of

water for 24 hours. Imagine my surprise when a week later the can was alive with germinating plants. I set out 20 in the spring, but suspect I have lost them due to drouth, as they were not well enough established to go through such a dry spell.

P. nelsonae should be better known and I hope some day to have plants

enough to get it started in various parts of the country. It is good at the foot of a rock garden, in a group planting, or in a border, with blue Penstemons of the same height. It is a lovely yellow Penstemon and worth the effort to keep it growing. It seems that it was much easier to walk into the golden morning and find *P. nelsonae* than it has been to keep it.

Penstemon Collecting

C. R. WORTH, *New York*

To anyone who delights in collecting plants, Penstemons offer an intriguing challenge. Distributed from coast to coast, and from Alaska to Central America, at least one or two species lie within easy reach of almost everyone on the continent. Eastern enthusiasts who cannot wander far from home are limited to a few of the duller kinds, but even these offer some variety in color and habit, so that an afternoon can be spent profitably in selecting the most desirable forms. People who live, or travel, west of the Great Plains have a tremendous wealth of species, differing widely in form, habit, and color, among which to revel.

In spite of the large number of species which have been brought into cultivation in recent years, largely through the efforts of members of the American Penstemon Society, some of the very choicest still await introduction, while a number of recently discovered species need further collection and study, as well as material for gardeners to test. Nor does the impressive list of species which have been available in recent years mean that there is no point in collecting more seed of most of these kinds; more than a few have not as yet taken kindly to garden con-

ditions, and further collections are needed, until the plants settle down in cultivation.

Those who wish to see Penstemons in the wild, and to collect botanical specimens and material for propagation, may use either or both of the two methods in laying out a route to be traveled. It is often fun to collect at random, simply selecting a region because of interest in its name or in some physical feature, and then to explore more or less thoroughly to see what plants may turn up. Disappointment is likely to result from such a procedure, for all too often the plants found will be only commonplace. Often, too, one will drive right by some greatly desired plant without suspecting its presence.

A more serious and thorough attack may be made, when dealing with Penstemons, by procuring the various papers of Keck and Pennell, which not only describe the known species, but offer fairly extensive lists of localities where each species has been collected. After noting the species in which one is most interested, their stations (localities) should be marked on a good road map, selecting the most reasonably approachable locations of fairly

wide-ranging species, and then laying out the route to be followed so that the various regions can be reached most expeditiously.

The time for making a trip should be governed by what one wishes to see and to collect. As Penstemons are ever-green, if one has keen eyesight, and a keener "nose" for plants, the trip may be made at any season when snow will not interfere. It is, of course, far more pleasant to see the plants in bloom, and the papers referred to, as well as regional floras, give the approximate time of flowering. In most of the Rocky Mountain region, little is to be found in bloom before June, while many species either flower much later, or keep up some bloom throughout the summer. In southern Arizona, however, fall to early spring seems to be the flowering season for most species, while Texas, California, and Mexico demand some knowledge of local conditions. Seed, in even the hottest sections, requires a considerable time to ripen, perhaps six weeks to two months, and in the central and northern Rockies is best harvested in August and September.

Once in the field, and arrived at the reported locality for some particular species, how does one go about finding it? To paraphrase the old cattlemen, one must be able to "think like a plant" and to have the instinct for guessing where a plant would like to grow. This "instinct" can be acquired to some extent by accompanying an experienced collector on one's first trip; wits may be matched to see who will first discover a plant, and thus the novice cannot only gain experience, but gauge his own intuitive ability to outwit a plant.

However, it is not easy, or always possible, to acquire an adequate mentor, and the beginner must often rely entirely on his own untrained ingenuity. The first thing to do is to look

over the terrain and to select a likely location, and if this proves a failure, make another trial elsewhere. Fortunately for the Penstemon hunter, the predilection of this genus for growing on roadside banks often makes it possible to find even the rarer species by keeping a sharp lookout while driving along roads in the locality where the plant is reported to occur. Not many species are found growing in open flat places; they prefer steep banks and slopes, gullies, rock slides, the edge of timber. Only a few kinds, and those rather dull ones, venture into woodland. In the drier parts of the country, Penstemons usually grow not more than a few miles from mountains, preferring the foothills to open country, and in regions of low mountain ranges, as in parts of Arizona, the base of the mountains themselves. The monographs on Penstemons usually have very scanty comment on the precise habitat of a species. If a herbarium is within consulting range, permission can usually be obtained to examine the sheets of Penstemon there. On these sheets will often be found data giving very precisely the exact spot at which the plant was collected. But if after all preliminary spadework and efforts in the field, a species fails to turn up, it may not be at all the fault of the would-be collector. Cattle, sheep, the inroads of civilization, the season, the vagaries of the plant itself—any or all may explain its absence. Great stands of plants often disappear for little or no reason, sometimes to reappear in the same location several years later.

Once the plant has been found, it is advisable to press at least one good specimen, for checking the identity. But this specimen should be a complete one, not necessarily an entire plant, but a division at least, including everything from roots to flower, preferably with a

few well-developed seed capsules. Do not snip a mere fragment of flower and stem and expect that some botanist will identify your find accurately from this snippet. Even experts on the genus are forced to make wild guesses when confronted with inadequate material.

Next, as one presumably has more botanical interest in collecting a *Penstemon* (and it is greatly to be wished that botanical collectors would concern themselves more frequently with horticultural interests), material must be taken so that the species may be brought into cultivation. Seeds are best for this purpose, and recent tests indicate that *Penstemon* seeds may germinate better if collected before they are fully ripe and dry. The criterion seems to be in whether the seeds shrivel, in which case they are worthless, or whether when dry they are plump and brown. Whole stems, not single capsules, should be taken if the seeds are not fully ripe, and these should be placed in a paper bag and kept in a warm dry place to dry and shell out. Live plants, at first thought, offer a simpler and more ready means of establishing a plant, but such is not usually the case. Good results may be obtained if the plant can be set in the garden within a few hours of digging, but really expert care is needed to nurse back to health plants that have been carried around for several days before being shipped to some distant point. Even if such plants are able to reestablish themselves in the garden, they usually have tough going and do not look nor flower as well as garden-grown material; in the case of short-

lived *Penstemon* species, such plants may flower once in a last effort to reproduce themselves, then collapse from this supreme effort, usually without developing good seed. Collecting of plants is forbidden by law in some states, as is, throughout the country, the shipment of plants without proper inspection. So far as my own experience with *Penstemon* goes, once found they usually occur in such quantity that it would take a whole army of hard-working collectors to exhaust a stand; there are a few species which, at least in most seasons, are apparently quite scarce, but one of the usual objections to collecting plants, that of conservation, does not apply too seriously to this genus. But in spite of this, to avoid trouble, both horticultural and legal, collecting should largely be confined to the harvesting of seeds.

For those who would like to collect species which have not yet been tested to any extent in cultivation, I should like to suggest that the Rocky Mountain and Great Basin regions, from northern New Mexico northward, have been rather thoroughly worked over in recent years, and that the harvest of novelties to be found there is certain to be quite slim. Texas, southern New Mexico and Arizona, the Death Valley region of California, and most of all Mexico, are as yet virtually untouched, chances of finding really new species are quite good, and with very few exceptions the plants growing there are still unknown in gardens. It is to these regions that the *Penstemon* hunter of the future must turn for his greatest rewards.



Frank H. Rose

Penstemon flavescens in sight of snow

Penstemon Flavescens

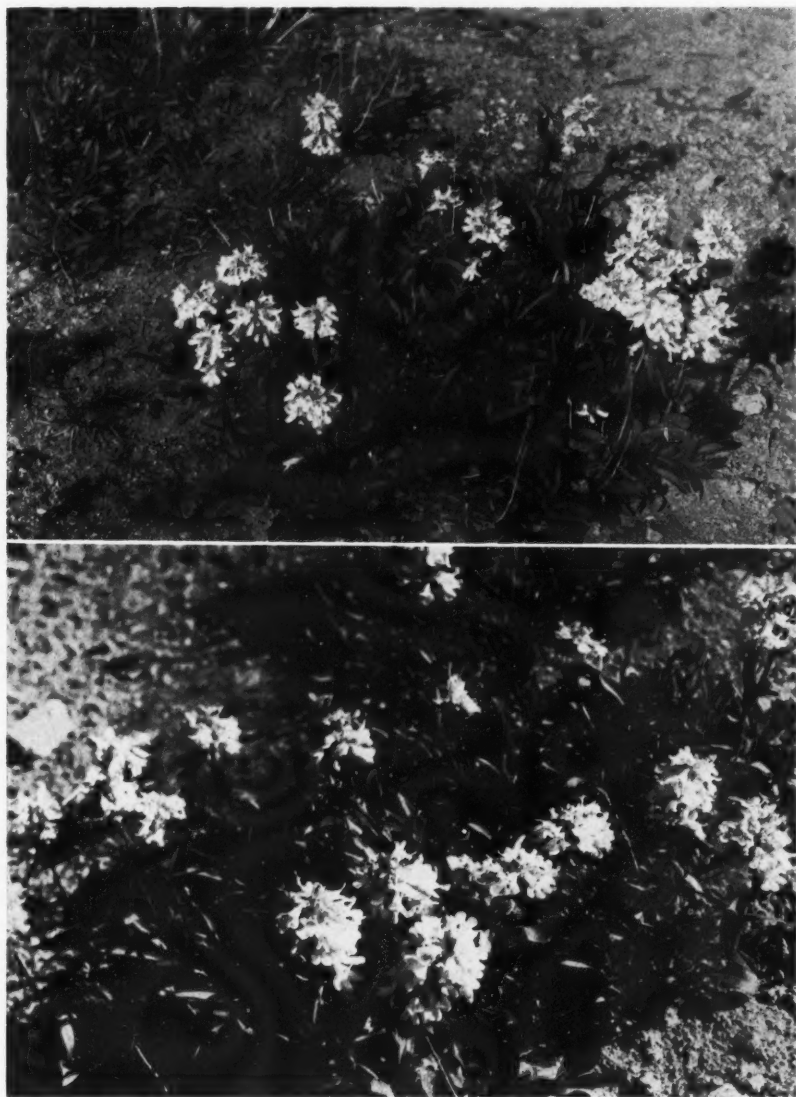
FRANK H. ROSE, *Montana*

P. flavescens, the newest addition to the yellow-flowered Penstemons, is native to granite soil in the higher parts of the Bitter-root Mountains of western Montana, and the adjacent peaks of northern Idaho. This is wild country, accessible only by secondary and dead-end roads that many tourists would not even ride over, let alone drive. It is largely a wilderness area, virgin-timbered and grazed only by wild animals. Up in the white-barked pine—Alpine fir zone of its restricted range, where the timber is open, or in burns and open clay-loam parks and hillsides, this Penstemon may be a very abundant species in the flowerful landscape.

It belongs to the Conferti group and is quite distinct with heavy rounded heads and thick-clustered flowers of rich cream or occasionally white. The many sterile shoots form a near sod

with abundant leafy flower stems in favorable seasons, standing a foot tall over the foliage clumps. A drug company's interest in *Veratrum* roots, of possible value for high blood pressure, induced me to pitch my tent last summer on a remote mountain top where this Penstemon had been used lavishly by Mother Nature in her landscaping. The plants were perfect in early August, but before I got pictures, a heavy hail storm riddled all flowers in the area. They came back bravely through the rest of the season, and the accompanying pictures were taken late in August.

Dr. Pennell and Dr. Keck have each described this species in print—Pennell in *Notulae Naturae*, No. 95 of March 1942; Keck in *The American Midland Naturalist*, Vol. 35, No. 1 of January 1945. I have no real quarrel with either description. (Is it Dr. Wherry



Frank H. Rose

Penstemon flavescens (kirkwoodi). Two colonies in nature.
Gardeners please note the empty earth!

who says that "about" should be understood as part of every botanical statement?). Pennell says "foliage light green," Keck says "deep green"; the site, not sight, makes the difference. Both mention the green medial portion of the sepals, but neither adds that the "subulate" or "attenuate" tip is often as red as the collector's nose, and probably for the same reason. Nor does either mention the red anthers, and this I consider a mild insult to *flavescens*. My Catholic friend saw a red cross in each flower, but I thought the flowers were surely feminine, for who else would have added the tiny touch of red coloring to the perfect ensemble? Pennell and Keck agree that the flower color is yellow, "light, pale, or chartreuse." To me it is cream, or is that a food and not a color? The fifth stamen is bearded all right, with stiff hairs either "golden" or "yellow," there is no need for me to split them further. You will know the plant if you visit its home.

The favorite site of *flavescens* is on more or less permanently moist clay-loam of granite mountain tops, testing pH 5-7. I don't know it on lime soil, or expect to find it there. While most plants are on rather thin soil, apparently almost any amount of humus or gravel is acceptable mixed with the clay. Along road banks, and probably also in cultivation, the foliage is deeper green and the plants more robust, while less-favored foliage is paler but flower stems apparently no less numerous. It is not found in wet meadows or heavily grassed parks. Frequent showers keep the soil moist, but air circulates freely in this high country, as you who have tried to stand on a peak may recall, and the quick drainage plus the air circulation dries the foliage almost as soon as the rain stops.

In common with other alpine plants, growth starts as soon as the snow melts. Where the drifts are deep and may not disappear entirely before new snow falls again, plants may be found in bud, close to the snow, or with matured seed further back from the drift. With only a three-month season free of snow, this plant has learned nothing of summer dormancy. If we extend its season in gardens to six or nine months, it may not make any better use of its added leisure than the rest of us. It grows in full sun, but "cold sun," not hot, and it will probably want a cool location in lowland gardens.

Mention of some better-known plants which are co-mingled with *P. flavescens* may be of help to gardeners. *Erythronium grandiflorum*, *Epilobium angustifolius*, *Phlox diffusa scleranthifolia*, *Polemonium pulcherrimum*, *Valeriana sitchensis*, *Campanula parryi idahoensis*, *Anaphalis subalpina*, *Veronica cusicki*, and several species of *Vaccinium*, seem perfectly happy over much of this area. *Phyllodoce empetrifolmis*, *Gaultheria humifusa*, *Mimulus lewisi* and *Aster integrifolius* sometimes mingle with the Penstemons but usually prefer the still more moist stream-side.

P. flavescens is now in cultivation with some members of the American Penstemon Society either under its true name or as *P. kirkwoodi*, as it was sometimes called before Dr. Pennell named it officially commending its color. I hadn't realized until last summer how attractive its rich cream flowers could be. Rules for its garden culture probably should come from a gardener—a plant collector may not "think like a plant"—but it is certainly worth a trial. If you can grow it as I have seen it in the wild, you will be well repaid for every effort.

Concerning *Penstemon Dissectus*

B. Y. MORRISON, *Maryland.*

It is perhaps only fair to admit at once, that the writer has always been keen about pictures of plants, and that it has mattered very little to him whether or not they represented things that he could possibly grow. Such a plant was brought to his attention with the appearance of the lovely plate by M. E. Eaton in *Addisonia* Volume 21, No 2 for April 1940, where *Penstemon dissectus* is shown as Plate No. 684. In such a time as this when all the literate writers entertain themselves with searching for "reasons-why" it may serve to send them off the track in this case by saying that this charming plate reminded the writer of the equally lovely but not easily brought into cultivation pink gerardia that grew in thin woods nearby and that balked attempts at cultivation because of its semi-parasitic nature.

Through one of the taxonomic botanists in the office it was possible to find another then living in Georgia who could and would, for the usual worldly inducements, gather seed of the desired species.

This arrived in due season, was turned over to the expert propagators of the Division of Plant Exploration and Introduction who in turn produced from it a formidable array of young plants that submitted apparently with good grace to beginning life in a greenhouse and small pots until the stock could be planted out in the frames. There the plants grew apace and in time were sent out to persons who claimed for themselves at least some skill in growing plants and bringing them into the next stage, namely, propagation for commercial placement. Apparently none was expert for we have

no record that any of the hundreds of fine young plants sent out ever became the mother-of-thousands for the waiting public.

Since the writer's interest was due entirely to the plate in the publication of *The New York Botanical Garden*, it is proper that Mr. Edward J. Alexander who wrote the accompanying text should also be cited for he gave us the needed clues to the preliminary treatments. It is with pleasure that we quote.

"Among the approximately 300 species our present subject stands out as unique in two ways. One of them is the dissected leaves. The other is the reversal of the usual manner of cut-leaved plants in which the basal leaves are dissected and the cauline ones entire—our present subject has entire basal leaves and dissected cauline ones. Its uniqueness is further emphasized by its great rarity—it is known from only five counties in south central Georgia, and there is confined to rocky or dry sandy places. The area of its occurrence is known as the Altamaha Grit Region, one of the more recent geological formations on the Atlantic coastal plain.

"The plant was first described by Stephen Elliott in 1822 in his 'Sketch of the Botany of South Carolina and Georgia,' the descriptions based on specimens sent being by James Jackson of Louisville, Ga. * * * It is easy to understand how a plant as rare and local in its occurrence has escaped being introduced into cultivation, but it is hoped to remedy this situation in the near future. * * *"

No note has been found that would suggest how long a life the individual

PLATE 684

ADDISONIA



PENSTEMON DISSECTUS

*Reproduced by special permission of the New York Botanical Garden
From Plate 684—Addisonia*

plants may live on their "rocky or dry sandy places" but our own experience with the plants that were kept in the frames at Glenn Dale, Maryland, where the soil is definitely sandy and in a situation where the sun would beat upon them for a long, long summer suggest that the plant is in no way long-lived as compared say with a peony. On the other hand, it is not as short-lived as a foxglove may be and often is under common garden treatments. The enormous capacity for the production of seed, even "in captivity" would suggest further that a long life need not be imperative to the preservation of the species.

Apparently the proper and normal life consists of the production of the large rosette of undivided basal leaves that form in late summer and autumn, over winter as such to provide the following spring for the development of the moderately branching flowering stalks that with us rose to about two feet. These while vigorous enough were not coarse and with their branching provided the structure from which depend the slightly nodding flowers, that make good masses above the dissected compound leaves of the flowering stalks. The general effect of the flowers is rose pink. Actually, the lobes of the flower are the source of the color, a slightly dulled rose color, that spreads as a flush of pale phlox pink over the upper surface of the tube which is basically white and which shows as white inside and at the opening of the mouth. The altered stamen is conspicuously exerted and shows its brush clearly. Flowering began in June and lasted well as the first lot of flowers is followed successively by the others in each unit of the compound inflorescence.

It is a matter of sincere regret that we have no notes to offer about its companion plants in nature. So often

one may find in them a further key to the development of the plant in gardens, which no matter how they may be adjusted to special plant requirements must be an artificial arrangement for the benefit of a greater number of plant species than may occur in the homes of any one of them. It seems probable that no one would propose this plant for any ordinary border in which it might have to compete seasonally with vigorous and familiar garden perennials and annuals; and it seems equally likely that one need not give it too meager a diet or too carefully prepared a root run, unless one lived in a region where such would be imperative on account of excessive total rainfall. From experience with other plants that come from regions where the summer is no hotter than in places further north but where its extension in time is much greater, as for example three and one half months of summer heat here in Maryland as compared with probably five months of summer heat in Georgia where the plant grows, one must not be too surprised if its behavior in the North takes on certain irregularities of a temperamental nature.

Although there was no opportunity of trying it, it seems not unlikely that if one could find a garden site, in which the plant could be used in a position above eye-level, one might find an even greater loveliness in the masses of rose pink flowers nodding above the thin stems with their finely cut leaves. There need be no heresy in this, since Penstemons do find homes in the faces of rocky cliffs in the East and the writer has seen fine clumps of the not much beloved *P. hirsutus* hanging from the faces of cliffs in upper Maryland, which if photographed by the proper, tongue-in-cheek photographer would send the rock gardener who cherishes 'wee jewels' into paroxysms of delight.

Penstemons From a Car Window

JEAN WITT, *Washington*

Penstemons are great lovers of road cuts, in the Northwest at least, and any Penstemon-minded traveler who has his eye out can pick up their bright colors easily from his car window.

Our first Penstemon of the 1950 season was *acuminatus*, which we found in April, growing on the sand dunes of the Columbia River between Vantage and Beverly, Washington. The densely clustered bright blue blossoms all but eclipse the glaucous leaves, and are highly colorful either as clumps or single spikes. It seems incredible that anything can survive in pure sand, but we found that though dry on top it was quite moist underneath.

In May and early June *Gairdneri* blooms in great sheets of orchid and lavender along U. S. highway No. 10 on the Saddle Mountain summit east of Ellensburg, Washington, and on other dry barren ridges in Kittitas and Yakima counties. The plants form compact tufts of bloom-stalks 8 or 9 inches high, the flowers large and flaring, and the grayish foliage small and neat—to my mind the most attractive of our dry land species.

Early in June we found a patch of blue, blue *speciosus* clinging to the inhospitable rocky sides of a road fill just east of Ellensburg. This tall, large-flowered species is widespread throughout central Washington along U. S. No. 10. It grows as numerous single wands waving from road cuts, or it may occur as isolated open clumps along dried-up streams.

Toward the middle of June we drove east along U. S. No. 10 from Seattle to Livingston, Montana, at the height of the Penstemon season. Both east and west of Missoula, Montana, we ad-

mired colorful foot-high Penstemon plants on banks and on the shoulders of the road. This proved to be *albertinus*, more robust in forms here than in northern Idaho—more stalks of bloom per plant, the stems all but hidden by flowers. The color range was wider also, from pale sky blue through a brilliant medium blue-purple, and the colors themselves were very rich.

We stopped again on the prairie between Helena and Three Forks, attracted by the great orchid flowers of *crinitus*. To our surprise we found a second species—*aridus*—in the same little dry wash. The plants were no more than 5 inches high, with closely crowded blue flowers borne well above the tufts of needle-like leaves. The blue is pleasing though not vivid, and the neat habit suggests rock garden possibilities.

In Yellowstone Park the wild flower displays were unusually fine this past season. Of the several species of Penstemon found there, *cyaneus* with its tall spikes of rich blue, is the most brilliant. It is fairly common in the northern part in the Park in June and July, at Pebble Creek, in the Lamar Valley, and especially along the north entrance road below Mammoth Hot Springs. In the vicinity of Old Faithful it is replaced on the road cuts by the more lavender *glaber*.

Fruticosus covers the granite knobs east of Cooke, Montana, with masses of lavender, and together with *montanus* is found along the Cooke City-Red Lodge highway on the Beartooth summit. Beautiful *montanus* is a rather ragged inhabitant of high mountain talus slopes, but when sheltered it rounds



Jean Witt

Penstemon Gairdneri v. *hians*; *P. acuminatus* (upper)
P. procerus; *P. albertinus* (lower)



Jean Witt

Manito Park, Spokane, Washington
Upper: Penstemon, Sensation Hybrids
Lower: The same in perspective

large orchid-lavender flowers. From one such ball of bloom, no more than 8 inches across, I cut 60 flowering stalks to press. You see why I have visions of this jewel in our rock gardens!

The Penstemon season continues into August at higher elevations and lingers into September in Glacier Park,

where we saw patches of pale orchid *lyalli* at Logan pass on our return trip. My favorite among our northwest late bloomers is *richardsoni*, which was still displaying a few rose-red blossoms on September 20 near Cashmere, Washington, on the east side of Stevens Pass.

An Open Heart For Penstemons

CLAUDE A. BARR, *South Dakota*

In the early Thirties when my love for Penstemons was about to emerge from the casual stage, in a remote bad land haunt I came upon a plant in full bloom in deep dusky lavender, of *Penstemon albidus* which is normally white or near white. One may presume, I trust, that Nature in playful mood had done a modern florist's trick with the pigment that provides blackish purple lines in the throat of *albidus* and had changed the flower's whole complexion. After a moment's consideration of that shadowy color the reveler was left to spread its beauty on the desert scene, and perhaps without loss, for not too much can be done with *albidus* in the average garden, it seems.

About the same period, in another locality, a flash of deep and vibrant azure under a roadside fence caused hardly a ripple in pressure on the gas. The quite heavy soil there regularly harbors only *P. albidus* yet on all the northern Great Plains only one flower possesses that thrilling power to catch the eye and stab the lagging heart to attention, *Penstemon angustifolius*. For that false step regret will always shadow me. How I would like to know!

In his article, A Garden of Penstemons, THE NATIONAL HORTICULTURAL MAGAZINE, October, 1933, D. M.

Andrews mentioned the occurrence in blue Penstemons of partial albinism, in which blue pigment is omitted resulting in flowers of clear pink or rose and "often very beautiful." Mr. Andrews' article, I believe—dissected, devoured and perhaps still in process of digestion since I have just referred to it—together with some correspondence and a visit to him at his nursery and home in Boulder, Colorado, inspired a determination which might be sloganized, "Give Every Flower Its Due." This more intelligent evaluation of chance forms of plants has been augmented immeasurably by the insistent and continuing interest in new and noteworthy forms, expressed in correspondence over the years by Mrs. J. Norman Henry, and it does indeed constitute a major delight in plant hunting.

Penstemon eriantherus, the first of its tribe to come into my acquaintance, is a difficult one in the garden but grows in untold myriads in suitable heavy alkaline soils, especially a very sticky clay known as the Pierre, a broken down mud shale. It is occasionally found in pink and white in addition to the typical rosy lavender. All are of bewitching beauty.

Many miles and many days may be spent in continual pleasure in hunting



Claude Barr

Penstemon haydeni

through stands of *P. angustifolius*. Now and then light and dark tones are found, both perhaps better expressed in other species. To be at its finest *angustifolius* dons a rather deep glowing azure. Then its full-limbed, full-throated, full-spiked beauty is enhanced by touches of yellow in anthers, pink in the throat and in buds and a luxurious glaucous coating in its green parts. White and pink forms, very rarely met with, are only less beautiful in failing to match that wonderful seductive blue of the type.

In 1941 and '42 Mr. Bernard Harkness and Mr. Briggs came plant hunting onto the Great Plains from Wisconsin, and brought, the first year, from the neighborhood of the 100th meridian *Penstemon grandiflorus* in pink and in deep purple. This very large flowered species is typically a strong lavender, varying just perceptibly toward bluer

or pinker, the white, pink and purple being definite and white variations from the norm. There is some variation in tone in the pinks, the best of them being wholly admirable. The pure white is an outstandingly fine flower. A fifth color form has lately been discovered, with some lavender in the bud and the flowers nearly white, with a flush of pinkish lavender as compared to the pure white. Unfortunately the deep purple found by Harkness and Briggs in '41 and not met with on their second expedition, was lost, though dispersed to several gardens. It is mentioned to establish the fact that *grandiflorus* does occur in purple in the wild.

Penstemon haydeni is notable in varying as a whole from all other species, a wayward wanderling that somehow plumped from untraceable parentage into a blow-out in the Nebraska Sandhills and found those soft shifting

sands of almost hour-glass fineness a suitable cradle and almost exclusively the only endurable mansion in its maturity. It is grouped with the *Coerulei*, three other members of which inhabit portions of this vast sand hills region, *nitidus*, *angustifolius* and *grandiflorus*, which find acceptable habitat also over much more extended ranges.

All green parts of *P. haydeni* are very glaucous. The leaves, as may be observed, grow from the ground up, taking their typical form somewhat up the stem, long, narrow, deeply channeled. Under optimum conditions stems may be an inch in diameter at the base and twenty inches tall but are most often three-eighths in thickness and a foot or so tall. Some upper stem leaves may be noted with wide bases, approaching the very wide based, technically termed, bracts which subtend the flower clusters. On the other hand some of the bracts are but little wider than the average leaf. Blossoms are large, an inch long or more, a milky blue with a definite tinge of lavender—so that there might be pink forms and of course there might be albinos. Neither has been observed or reported.

Unusual for *Penstemons*, *haydeni* has a strong and pleasant fragrance.

The blooming period is in June and July. Large numbers of buds are produced in each cluster. As a blossom ages and falls its place is taken by a new bud so that full spikes are maintained for ten days to two weeks. With early and late stages in a group of plants blossoming lasts about a month.

P. haydeni is one of the first plants to establish a foothold in a blow-out, which is a pit cut by wind in "blow" sand. In consequence it enjoys freedom from competition for moisture. To keep contact with available moisture, often scanty, it sends down a very deep root. A seedling of four or five inches will have a root much more than a foot long. A peculiar faculty of the plant is that when covered with sand by a "blow" it can grow up to the light and also develop new roots from old leaf nodes.

In the garden *haydeni* is not difficult. The plants pictured flowered in 1950 from three to four inch yearling plants brought from a native stand in June of '49, in eight inches of fine, nearly clean sand above a heavy clay, well drained.



B. O. Mulligan

Penstemon rupicola var. *albus* — June 3, 1950

Some Shrubby Penstemons in Seattle

B. O. MULLIGAN, *Washington*

Of the several shrubby species of Penstemons native to the state of Washington, none, in the writer's opinion, equals that so well named *P. rupicola* by Howell in 1901, for the brilliant effect of the rich carmine-rose flowers so enhanced by the glaucous foliage, especially when set off by the slabs of grey rocks amongst which it is frequently found in the Cascade mountains. It is, in some instances, hard to appreciate how the plants obtain enough moisture in such surroundings to supply their needs through the four or five summer months when they are free of snow; the plate opposite p. 169 in Dr. I. N. Gabrielson's "Western American Alpines" is typical of such locations.

But *P. rupicola* varies somewhat in hue, and from a nursery near Portland, Oregon, we obtained in 1948 both a pink and a white form which have grown slowly on the top of a low stone wall, remaining in all other respects like the parent species, and, for a comparatively moist situation, flowering very adequately. Neither, however, has the charm, character, or color of the original, and except perhaps for the specialist or collector may remain in the background.

The other species or variety illustrated is somewhat of an enigma. Received as *P. serpyllifolius*, from the same source in Oregon, with the catalog information that it had been found in the Olympic mountains of Washing-



B. O. Mulligan

Penstemon Menziesi—variety? received as *P. serpyllifolius*
(Some "penstemoniacs" refer it elsewhere. Ha!)

ton, it does not fit with any *Penstemon* included in Dr. G. N. Jones, "Botanical Survey of the Olympic Peninsula," (1936). However, it is evidently a close relative or form of the widespread *P. menziesii* Hooker, being completely prostrate, with branches notable for a remarkable production of roots along the lower side. Leaves $\frac{1}{4}$ to $\frac{3}{8}$ inch in length, compared with $\frac{3}{8}$ to $\frac{1}{2}$ inch in *P. menziesii*, similarly toothed at the apex, but with a more pronounced petiole. Detailed comparison of the flowers has not been made, but those of *P. serpyllifolius* are certainly comparable in size and of a richer tone of purple than many wild plants of *P. menziesii*. As a prostrate carpeting shrublet it will probably be valuable.

In addition to these, we are growing some seven or eight other species in Seattle, from the Californian *P. corym-*

bosus and *P. cordifolius*,—both having survived our abnormally severe winter weather of January-February 1950—the free-flowering, bright purple *P. cardwellii*, reported from both Washington and Oregon; *P. barrettiae* with broad, greyish foliage, from the cliffs of the Columbia; a cultivated plant received as *P. adamsianus* which appears to be intermediate between *P. barrettiae* and *P. fruticosus*, and finally the native *P. fruticosus* from the eastern side of the Cascade range, where it enjoys steep and exceedingly well-drained slopes, forming trailing masses three feet in length or diameter, sometimes alone, sometimes in the company of *Symphoricarpos*, *Rosa*, *Purshia*, or *Ribes cereum*. Both white and pink-flushed variations exist in *P. rupicola*, and may have some garden use and value.

The Mystery of Flathead Lake

This is an unsolved mystery story, a few clues to which we are here offered.

Not many years ago Mr. George H. Murray, nurseryman and hybridizer, found growing wild near Flathead Lake southwest of Glacier Park, in western Montana four plants of an apparently still unidentified herbaceous *Penstemon* which he suspected might be natural hybrids or one hybrid of *P. barbatus*, for, since the plants are mat-forming, it is not impossible for them to have had a common ancestor. One plant he gave to Mrs. Anna Johnson of Butte, Montana retaining the other for himself. No further information at present is available from Mr. Murray who has moved away and so ends our clue.

Mrs. Johnson established her plant successfully in her garden and carefully collected the seeds. Now the plot thickens. Supporting the hybrid theory, second generation seedlings showed considerable variation and still more baffling, hospitality to the pollen of almost any other *Penstemon*; they ranged in height from 12" to 24", the foliage resembled the familiar *barbatus*, mats of green lanceolate leaves 2" to 4" in length, the flower stems rising gracefully above the basal growth with racemes of very lovely pink to red bells rather than tubular as in *barbatus*. They continued until late fall sometimes bravely blooming above the first snow blanket.

Plants with so improper a family history obviously cannot go out in general society, they do not even possess a name but must be inaccurately referred to as the *Penstemons* from Flatland Lake, inevitably and dangerously abbreviated to "Flathead Lake." How-

ever murky the origin of this strain, its garden merits are clear; hardiness to any amount of cold, a marked tendency to longevity, adaptability to different climates and soil conditions, a very long period of bloom and the wide mats are easy to divide too.

It may be that tracking down the original progenies of these mystery plants is an horticultural puzzle demanding too much time and patience for troubled days. Mrs. Johnson has shared open pollinated seeds with other amateur *Penstemon* growers and has continued sowing it herself; as was to be expected the variations have increased, the rich rosy red color still predominates but there are soft baby pinks, some vivid almost orange scarlets, a few dark rich maroons. Mrs. Johnson writes, "I have so many different colors and shapes of foliage now in the garden from seeds of the same plant that it is impossible to unravel the puzzle. I must admit they are getting out of hand and sort of 'in my hair.' What shall I do with all these seedlings?"

Mrs. Johnson has also made some controlled crosses, the pollen of known pedigree but the seed parents, because of their unfailing hardiness and good constitution, selected from the equivocal progeny of the plant from Flathead Lake.

The pollen of *P. grandiflorus* produced one astonishing plant; the basal foliage is blunt somewhat like that of *grandiflorus* and more glaucous than in the Flathead Lake strain, but the stem leaves resemble the seed parent; the blossoms appear in the leaf-axils as many as six in a tier, set flush on the stem as in *grandiflorus*; the color is startling, a blended pink and blue

which shifts like a neon sign from one to the other as you move to view it from another angle. In late September this plant had reached a height of 38" with nineteen tiers of blossoms and seed pods some of which were already ripening.

The pollen of "Firebird" ("Cherry Glow") produced taller plants than the female parent with larger flowers of a pale pink color.

One plant that may prove to be very worthwhile was obtained with the English dwarf "Six Hills Hybrid" reportedly the offspring itself of *P. rupicola* and *P. newberryi*; a single plant, dwarf, compact, with the flower of a rich rosy color is referred to privately as "Flamingo."

It should be said that Mrs. Johnson is altogether an amateur gardener, though a skillful one with a very full life outside the realm of horticulture. Her work with the auriculas may have conditioned her for genealogical obscurities since the family trees of these exquisite primulas disappeared into the night three hundred years ago. Clearly Penstemons of merit are originating in her garden right now; perhaps the mystery of Flathead Lake can still be solved, perhaps not. The strain, if it is permissible to call it that, needs to be worked over, the subsequent crosses carefully recorded, studied, tested and possibly modified, at long last a few individuals may prove worthy of asexual propagation and naming, for the rest it would be possible to have a "Flathead Lake Strain" in Penstemons as we now have a "Pacific Strain" in Delphiniums and a strain of "Russell Lupines."

For amateurs who wish to try a few

Penstemon crosses, Mrs. Johnson offers some tips. She says: "They are very easy to work with but of course not all species will cross, not even in the same groups. The important chromosome counts have been made of only a few species. Single out the stigma from the five stamens (four with anthers, one sterile) and dab on some pollen from whatever other Penstemon you want as the other parent. The stigma is always the "tail" on the ripe seed pod. If you have trouble making the pollen stick, put it thickly on the sterile stamen instead, and using the flat side of a toothpick, push it up against the stigma. The sterile stamen is usually bearded or woolly and will hold the pollen nicely and dust it thickly on the stigma. This isn't necessary as a freshly opened stamen-anther will do the job. If all the ripe anthers seem to have spilled their pollen, look for one that is fat and looks about ready to burst. You will need a magnifying glass and a long needle and two more hands than you have! Be sure to cut off all the anthers in the blossom you are crossing or your work will be done for nothing. Also if there are lots of bees or other small insects around, cover the blossom with a very thin film of cotton batting or medicated cotton, just enough to keep out the insects. The cotton has no weight and sticks well. Do all the crossing in dry weather.

"It takes a lot of patience waiting for the results of crosses and there are lots of disappointments but hybridizing can be a lot of fun. Mr. Murray got me started and I look back on that day as a turning point in my otherwise uneventful life."

Regional Reports

The second half of the twentieth century is hardly the time to "invoke the patience of the gentle reader," as in Victorian days, but in offering these Regional Reports, the American Penstemon Society perhaps owes an explanation and apology. Our intention is to present some very representative gardeners from all over the country, gardeners who are working with a group of plants far from domesticated. Their reports on Penstemon behavior in the wild and in their gardens contain much repetition, and some contradiction, mingled with a multitude of inharmonious names. But the subject is new, the information far from complete, and each writer adds his or her individual bit of experience to the fast-growing total. We believe the reader will enjoy the glimpses of gardens and personalities in these reports. Only space limitations prevent the introduction of many more gardeners, equally able and enthusiastic. We still have errors to correct, problems to solve, and new discoveries to make, and we hope to attract some fellow travelers on this voyage of Adventure.

To the many fine contributors, both distinguished experts and home gardeners, who responded so graciously to make this Penstemon issue a success, we give profound thanks.

The Fate Hybrids

FRED H. FATE, *Missouri*

As a student of nature, wild flowers have always been of interest to me. I liked those that seemed to be fool-proof, that combined hardiness with a fairly long season of bloom, freedom from disease, and good color. *Tradescantia*, *Verbascum*, and *Penstemon digitalis* were set in my garden for study and improvement. I am glad to see them in cultivation now.

My first work with Penstemons was about 1933 when I tried to cross *P. grandiflorus* and *murrayanus* on *digitalis*, to get more color into that species. As I was ignorant of the laws of genetics, my project failed. However, I did put some *murrayanus* pollen on a few *grandiflorus* flowers, and some seed set. These bloomed in 1935, and all the flowers were a dull gray-purple, larger than those of *murrayanus* but smaller than *grandiflorus*. They were so unattractive that I discarded them. By some stroke of fate, I hadn't planted

all the seed, and the following year I found it and repeated the process. This time, among the seedlings was a very beautiful coral-pink with large flowers. All my hybrids have descended from this plant.

The second generation was a riot of color, and new ones appear in each generation. These hybrids are nearer *murrayanus* than *grandiflorus*, mostly willowy, with *murrayanus* type flowers but larger. The color range extends from white through all tints of pink, salmon, scarlet, crimson, rose-purple and lavender to dark reddish-purple approaching black. Some are tinged with gray, and two plants had flowers with white throats and only the faces shading to pink and lavender, but I have never had a pure white such as appears among the Seeba hybrids. The cream-colored ones do not come true from seed, but I still have hopes of a good yellow flower some day. Both plants with the white-throated flowers died after blooming, but something interesting may show up from their seed-

lings. These hybrids bloom throughout June and provide good color for the back of the border, the red-toned ones going nicely with delphiniums.

They like a well-drained sunny place but will grow in partial shade. The soil must not be rich in plant food, but they seem to like some humus in the subsoil. Like all *Penstemons*, a certain percentage will die after blooming, but if seed stalks are cut off, new growth will nearly always come from the crown. The taller ones must be staked or they will fall from the weight of the bloom. Also protect them from heaving if your soil is of a type where heaving occurs. Otherwise these plants are of very little trouble to gardeners.

The Seeba Hybrids

LENA SEEBE, *Nebraska*

In the fall of 1945, I sent to Mrs. Olga Tiemann for seeds of *P. grandiflorus alba*, and sowed them that fall. When these plants bloomed in the spring of 1947, they were all white except one which was plum-colored, with several stalks standing 50 inches tall. I took colored pictures of it because I had never heard of *grandiflorus* in any other colors than lavender, pink and white. It seeded heavily and I sent seeds to APS members and other interested gardeners, with no idea what the next generation would be. The plant lived over winter and bloomed again the next spring, but it wasn't very robust, and after seeding the second time, it died. I think if I had not let it seed so heavily, I might have saved it.

In 1949 we had our real thrill. Instead of plum color, we had at least four shades of dark red, light reds and salmon, dark and pale pink, some purples, lavender, cream, and pure white. The plants were also varied, some tall

and robust, others shorter. A few passed on after blooming, but many bloomed again in 1950, bigger and better than ever.

I have no idea what happened, but feel sure the plant had been crossed with *murrayanus* somewhere along the line, as many of the hybrids have the connate leaves, not all, but a good percentage of them. They seem to lean towards *grandiflorus* in other ways, including a short season of bloom. Mrs. Tiemann and other gardeners who have grown both strains report that they are surprisingly different. The Fate hybrids seem to show the *murrayanus* influence most strongly in taller spikes which continue to grow and bud after my plants are all through blooming. The Fate hybrids also seem to carry more yellow tones, with many pale pastel colors, but no pure white or plum purple. Both strains include the rich wine reds and bright crimsons, and we are all wondering what surprises the next generations will bring.

Penstemons Suitable for the Rock Garden

CLARA W. REGAN, *Montana*

This attractive and very large genus of plants offers, among its numerous species and forms, many plants ideally suited to the rock garden. It is important, when planting its miniature cliffs and hills with members of this race, that they carry out in form and manner of growth a suggestion of the bleak conditions under which many of them grow in nature.

This naturally brings us to a consideration of the Pacific Coast species of the *Fruuticosi* section. They are really small shrubs of a gnarled and woody appearance, not more than a few inches in height, some of them

ground-hugging, with thick, shiny green or glaucous foliage. They creep through the detritus by putting down rootlets from decumbent stems, or insert them in the crannies of their favorite cliffs. In the garden some regard to their rock-loving natures must be paid in order to insure success.

My own method is a simple one. I dig a small hole, fill it with a mixture of broken rock (not sand), good loam and leaf-mold. I add a small amount of superphosphate to meet a local condition. I set the plant in this, firm the soil well, and then heap more of the mixture on top, stones and all, so that the rootlets can have something to dig into. The new growth comes up between the rocks and looks very pretty and very much at home. Being saxatile plants, they love the proximity of rock which does something for their well-being. They grow in a part of the rock garden which is protected from cold winds and the hottest sun, as they dislike both, in my climate at least, being accustomed to more equable, humid, and milder conditions than most of us can boast of.

They have an odd characteristic—they resent having their woody branches broken, and I have lost a number of plants through carelessness in weeding. However fussy they are about accidental breakage, they are very accommodating in the matter of propagation; all one does is to detach a rooted bit and insert it in the soil, and it grows on to form a plant in no time at all. I cover the plants in winter, as being in reality broad-leaved evergreens, they are very susceptible to cold drying winds. They can stand any amount of wet cold but not dry cold.

P. rupicola is the best known and is found in many rock gardens where its leaden-green frosted leaves form a fine background for the rosy-red flowers.

But however fine it may be, it is not to be compared with the white form, whose ethereal loveliness in bloom makes it my favorite *Penstemon*, and I think my favorite rock plant. The leaves are a pale apple-green with an overlay of silver and the flowers are large and waxen-white with a crystalline sheen. A clump of this in full bloom is something to forever remember. *P. menziesi* is somewhat procumbent with narrow toothed dark-green leaves which are ovate, instead of being orbicular like the preceding. The flowers are a light lilac-purple. The form *alba* has smaller, very bright green leaves and waxy flowers.

The plant known as *Six Hills Hybrid* originated in the English nursery of that name, and *P. rupicola* is thought to be one parent. The other must have been *P. newberryi* from the appearance of the plant which bears a strong resemblance to that species. It makes a delightful bushlet of 5 inches with dark green ovate toothed leaves which are a beautiful crimson in spring. My two plants are bursting with health but never in five years produced one of the rosy-lilac flowers that they are said to have. *P. newberryi*, on the other hand, never knows when it is time to cease blooming operations, and its airy sprays of cerise-crimson flower for many weeks.

P. davidsoni is a close tangled ground-cover of many stems; the leaves are small, very dark green, leathery and untoothed. The seldom-produced flowers are rich violet and sit, penguin-like, erect on the green cushions of rounded leaves. There has been much discussion in *Penstemon* circles concerning a small plant known as *P. serpyllifolius*. It was found many years ago and given this rather apt name; and although found in that botanists' paradise of the Olympic Range, has



Fred Gibson

Penstemon barbatus v. torreyi (upper)

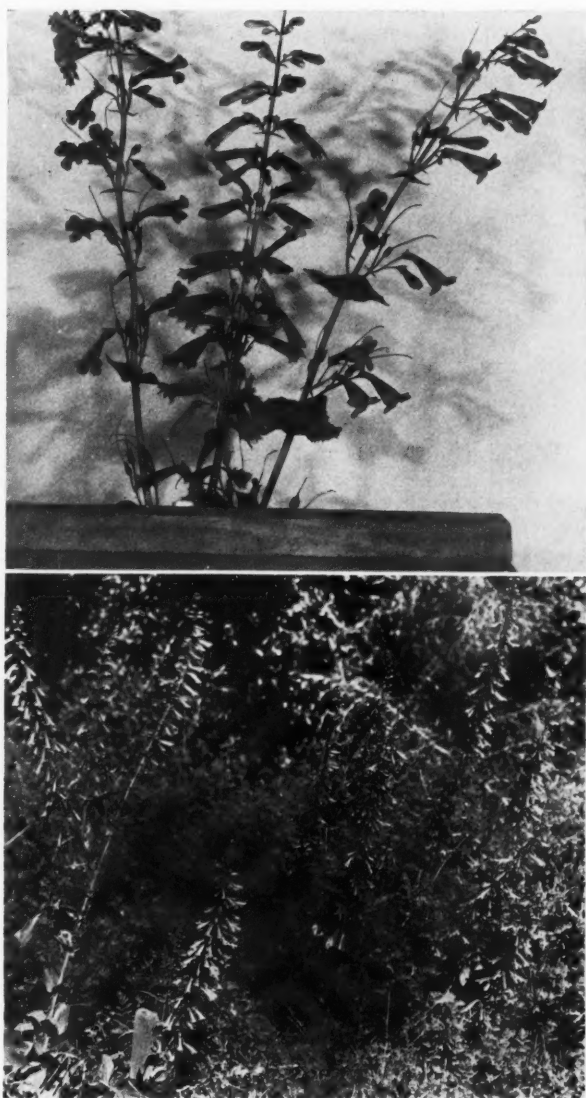
Penstemon parryi (lower)



Fred Gibson

Penstemon jamesii var. *ophianthus*

All photographs
by Mr. Gibson
are from The
Boyce-Thompson
Southwest
Arboretum,
Superior,
Arizona



Fred Gibson

Penstemon pseudospectabilis v. *connatifolius* (right)
P. eatoni *exsertus* (center); × *P. crideri* (left).

Penstemon eatoni v. *exsertus* (A. Nelson) Keck with
pale yellow flowered mutant at stake.

never been officially recognized by them. I have been asked to give my opinion concerning its affinities to other species—an opinion which I hasten to add is strictly that of a gardener. From observation of the two plants, I think it is close to *dauidsoni*, having the same creeping habit of growth, though not so compact, the same aversion to blooming, but when it does the flowers are very similar, but somewhat lighter in color, and likewise sitting erect on the stem. The leaves are lighter in tone, and while the basal leaves are almost exactly like those of *dauidsoni*, being round and untoothed, the new growth is ovate and minutely dentate.

We have in the mountains of the northwest another shrubby group much larger than those of the Pacific coast, with *P. fruticosus* as the type. They are *PP. scouleri*, *crassifolius* and *lyalli*, very much alike except in small details. *P. crassifolius* is a neighbor living near us at 6-8,000 feet, growing on bleak north-facing slopes where it is a stunted dwarf plant. But where it is protected from cold winds by boulders or some large bush, and has the benefit of the humus from decaying leaves, it can become an 18" shrub. It is as a shrub that I grow it in the rock garden. Perched on a high rock above a dwarf spruce, it displays in June numerous airy panicles of rosy-lavender blooms. It is one of the most graceful of the race. Other members of this section amenable to cultivation are *P. ellipticus*, small and rock-hugging, not yet flowered for me but delightful in appearance, and *P. montanus*, larger denizen of rock slides in the mountains.

Outside of the lovely sky-blue *P. nitidus* and the small tufted *P. aridus*, we have close at hand, only one other Penstemon I like for the rock garden. This is *P. diphyllus*, and it grows in the same bleak surroundings as *P. crassi-*

folius, but has olive-green lobed leaves and velvety dark-blue flowers. In the scree garden last summer it made a dazzling mound of blue, as blue as *Gentiana verna*, but the small flowers have a magenta throat—and continued well into September.

Farther south in the Rocky Mountain chain and outlying foot-hills and plains, there are many jewel-like Penstemons belonging mostly to the *Eri-copsis* section. Some of the most appealing, and perfect gems for the rock garden, are in the *Caespitosus* group of which *P. c. deserti-picti* (Painted Desert) is one of the loveliest; a small creeping plant with wee spatulate leaves, turquoise blue in color. The flowers are rather large, pale blue, and sit erect on the stems. *P. c. perbrevis* is even smaller, and *suffruticosus* is a larger variant, being a small shrub of three inches. All are very difficult to grow.

P. thompsoniae is somewhat similar to the above but has trailing stems from a central rootstock. It has tiny purple tubes for flowers. Dr. Worth, who found it in Nevada, says it was growing in dense shade, but I have the impression that another collector saw it growing on the sloping sides of clay hills. My own limited experience bears out the "shady cultivation" theory. Plants in full sun never prospered and finally died, but those growing in part shade are still living after two years in scree soil under a native juniper. *P. xylus* and *abietinus* are two more of this section, only slightly different in appearance. They make mounds of stems and foliage which is more linear and about 1/2 inch long, and produce great numbers of flowers, dark blue in the former, light clear blue in the latter. More to the point, they are easy to grow and soon make mats a foot across. *P. linarioides ssp. coloradoensis* is

something like the other two but the leaves look as if covered with hoarfrost. It has lovely bright blue flowers and is easy to grow. *P. crandalli* is also easy to grow in gardens and has been in cultivation for many years, but it has never been free-flowering for many persons, including this writer. This spring in a fit of pique, I threw on the plant a big trowelful of stable fertilizer and it *bloomed beautifully* for several weeks. It is a thought we might perhaps follow up in the matter of non-blooming Penstemons. Who knows?

The section Aurator has many lovely plants suitable for the rock garden but my experience with all of them has proved them too temperamental for garden use. Their motto might well be: "Here today and gone tomorrow," especially after blooming.

One other plant that adds color and beauty is strangely enough related to the giant *P. barbatus*. This is *P. pini-folius*, introduced by Dr. Carleton Worth and Mr. Amel Priest who collected plants and seed in New Mexico where it grows in cliffs and ledges of rocky hillsides. It has a very woody base and then in spring sends out long stems covered with short leaves (about $\frac{1}{2}$ inch long) somewhat resembling those of a coniferous tree. The plant looks best in a crevice where the "weeping" effect shows to best advantage. The flowers are long and thin, with extremely long lips, being well over an inch long and of a real "fire-cracker red." They began to bloom the last week of June, and as I write today on September 13, I found a glint of flame showing through the light snow that had fallen during the night; almost eighty days of flowering. Seed germinates readily and unflowered branches can be easily rooted.

P. eatoni has never given me as much as a seedling from much seed-

sowing so I cannot speak with any authority concerning its garden habits, but I was privileged to see it in bloom at the Boyce Thompson Southwest Arboretum last March, and also March of the previous year. This vast garden of xerophytic plants from all parts of the world is sixty miles from Phoenix, Arizona. The species growing there is *P. eatoni ssp. exsertus*, and was growing in low cliffs where it looked most beautiful with its stems billowing out from crevices and laden down with the scarlet tubular blooms. This variant has the anthers protruding. We saw it again near the glass house where it was wedged in tightly between stones of the path and was a foot taller. The director, Mr. Fred Gibson, said it was seven years old. Near it was another of the Beard-tongues, not to be used in a small rock garden, but so very beautiful and very rare that I feel I should mention it. It is *P. parryi*, a native of Arizona. It was growing like any border plant with many stems supporting airy panicles of lovely raspberry-colored blooms. In many Penstemons the red and blue pigment is distributed in blotches and spots, but in this one, the red and blue had been so skillfully blended that the color of the flowers was a solid wine-red, enhanced by a velvety texture. I have at the moment eight of the delectable plantlets in a nursery bed. The question is—will they live over winter in a high Montana garden as well as they do in an Arizona desert? Probably not!

Random Thoughts on Penstemons

DWIGHT RIPLEY, *New York*

After twenty years of gardening (on and off), I've finally, and perhaps reluctantly, come to the conclusion that longevity is not an essential requirement of a good rock-plant. . . . For almost two decades, though, I would

scarcely consider cultivating a species unless it promised to live for almost two decades; now I know better. Since coming to live in the Hudson Valley, I've realized that things like *Erinacea pungens* and *Daphne sericea* are not by any means the be-all and end-all of rock-gardening, and that in this particular climate, at least, many of the western American natives refuse to grow happily for more than a few years—often less than that. And this applies especially to Penstemons.

But then the genus is such a vast and complex one that the American Penstemon Society itself is split into two camps, one favoring the large-flowered top-heavy species which can't possibly last for more than a year or two but are just dandy for mixing with *Gypsophila* in that vase that used to be in the attic, the other leaning breathlessly over the tiny yet long-lived shrublets of the *Fruticosi* and *Ericopsis* sections: in other words those who treat the Penstemon as a *gladiolus* and those who treat it as a desirable alpine. Between the two, of course, lies the bulk of the genus, but it is not my purpose to discuss here such moderately long-lived, moderately manageable, moderately showy species as *PP. whippleanus*, *hirsutus*, *halli*, *tolmiei*, or *humilis*. No, let us consider instead the dwarf shrubby kinds beloved by Category Two.

Mrs. Babb especially asked me to state which *Fruticosi* do well here in this particular section of New York, and why. The answer in a nutshell is: they all do very well indeed, and never, never do they receive one drop of water even during the most trying moments of the solstice. The easiest and most floriferous is a plant that came to me as *P. newberryi*, but is not that species at all—more likely it is *Six Hills Hybrid*: at any rate it is magnificent each year with its ever-widening

mats of toothed leaves and abundant violet racemes. Equally easy, and more subtly appealing, is the renowned *rupicola albus*, a sport from Mrs. Berry's garden in Oregon, which here forms plants over a foot across on vertical rock-walls. These two then, the best of their group, are in a sense the products of horticulture. When we come to *P. menziesi*, however, we are met by the inescapable fact that (under our stern regime at any rate) it grows with such speed and enthusiasm that it is likely to die off in large patches, the tactless umber curtains having to be pulled away from the main body-plant of brilliant green. But until this happens, *P. menziesi* is a lovely sight indeed, and most generous with its purple blooms.

P. davidsoni, a close relative, is much neater and grows much more slowly, while *P. serpyllifolius* is neater yet and yet more slow-growing; and so far neither has shown any tendency to turn brown. The flowers of both species resemble those of *P. menziesi*. (I had heard that *serpyllifolius* were "blue," an unlikely, not to say impossible, color in the *Fruticosi*, but last spring finally revealed them to be violet.) Then we have *rupicola typicus*, less robust than *r. albus* but doing very nicely, and the reliable *barrettiae*, and *fruticosus*, each trying to outdo the other in general charm and vigor. All these as well as the following kinds are grown in full sun, in a mixture of three parts gravel to one part loam, and usually in tight rock crevices.

As for the second group of shrubby species, the *Ericopsis*, they too insist on a firm hand and no pampering. *P. abietinus*, that rare inhabitant of central Utah, is an exquisite sight each May, looking like one of the neater heaths peppered over with innumerable small flowers of gentian-blue. (That is to say, the plant we received from Dr.

Worth; those from an eastern nursery seem less robust, and come perhaps from a different "clone.") *P. crandalli* is equally amenable, but less distinguished. *P. linarioides* var. *coloradoensis*—enjoyed, I imagine, by the majority of penstemoniacs—is extremely easy, the var. *compactifolius* (also from Dr. Worth) bearing flowers of stronger color; while *P. acculis*, which got off to a good start, has proved every bit as cagey as it is reputed to be. *P. caespitosus*, in the typical form, has *menziesii*'s fault of growing much too fast and dying off in embarrassing places; but two of its rarer subspecies, *desertipicti* and *perbrevis*, more delicate and with glaucescent leaves, do not share this habit. *Thompsoniae*, a close relative with pruinose, almost white little leaves on a woody caudex, has deep violet corollas and doesn't seem to last for more than three seasons. *P. laricifolius* var. *exilifolius* from around Laramie, is a gem and very different in appearance from other members of its group: the thin racemes of flat, white flowers (opening from pink-mahogany buds) rise elegantly above cushions of emerald-green needles. In cultivation these spikes seem a shade too tall for the plant, but on the calcareous hills of southwestern Wyoming, disciplined by sun and altitude, they are beautifully in proportion. It takes astonishingly well to conditions in this garden, being now in its fourth year. And lastly—though this is not strictly an *Ericopsis*—mention should be made of *P. pinifolius*. . . Its whole habit is so precisely that of *linarioides* that one can't help feeling it must be a rather extreme outlier of that group, the shape and coloring of the corolla being specially adapted to hummingbirds. In any case it is a vigorous species, perfectly hardy despite a somewhat exotic provenance and apparently long-lived (plants raised

from seed do better than those collected in the wild), and its note of brilliant scarlet should do much to console you for the slight awkwardness of the racemes and for the shape and angle of the flowers themselves—too narrow and too upright, yet how very welcome during the interminable tropic vacuum of July and August! Here it perches happily on the severest of ledges, facing due east and fed a monastic diet of plain gravel.

East of the Cascades

ORRIE MARION, *Washington*

Our garden is 25 miles southeast of Spokane, Washington, in the eastern part of the state. Most people think that all of Washington state is like the Puget Sound area, ideal for gardens. Our section is not like that, for the Cascade Mountains lie between us and the Sound. Our soil is clay loam, our summers are hot and dry, our winters from 20 above to 20 below zero, and we have lots of freezing and thawing in early spring. In such a climate, we grow our Penstemons in elevated beds.

Within a radius of 20 miles, there are four natives: dark blue *procerus*, about 12" high, and lovely cream-colored *confertus*, 8" to 10" high, both small-flowered but the plants so covered with bloom that they are visible for yards. About three miles south of Spokane grows a beautiful medium blue one, *speciosus*, taller and more stately, about 18" high, with two or three stalks of bloom per plant and large flowers, half to three quarters of an inch long, but still needing several plants to make any showing. Further north of Spokane is the shrub Penstemon, *fruticosus*, growing in different locations, with leaves slightly differing, but bloom always the same, blue-laven-



Josephine de N. Henry

Penstemon procerus, Northern British Columbia
July 7, 1931

der waxy bells that almost cover the plant.

Shrub Penstemons are usually evergreen in this section. Once in a while a particularly cold and windy March will kill the leaves but new growth comes to take its place. At our old home on the farm, our rock garden faced west and so got lots of sunshine, and the plants started growth early in the spring. In our present new garden in town, where the oldest Penstemon has been planted for exactly one year as I write, we are growing them on the east side of the garage where they are sheltered from the west wind and hot afternoon sun. They are in elevated beds and on the bank.

Barrettiae (the lavender form) is our old standby which we have grown for 16 years. It is 12" to 14" tall with lovely gray-green foliage, covered at blooming with flowers of lavender-pink. It is used in different ways around Spokane. I have it growing in rock gardens, very much at home. I also know a lovely garden where it is used in front of the foundation planting. At the farm we used it as a border for plantings of iris, especially lovely in front of blues and pinky-tans. Here we have it on the north side of the house. The leaves of *barrettiae* change color with the seasons, purple in winter, green in spring, and gray in late summer and fall. Another strain of *barrettiae* is 8" to 10" tall with rose-red flowers and beautiful gray powdery leaves. This is fairly persistent, as I have had a plant for six years, and moved it successfully last May to the new garden.

Cardwelli grew in the farm garden for three years and bloomed heavily. Its tubes are more slender, not so open and flaring as those of *fruticosus*, and deeper lavender in color, with bright green leaves. Our plant increased fast

enough, but we lost it in moving here.

Fruticosus is one we will always want in the garden. It is a perfect green shrub, about 12" tall, with such large waxy lavender blooms. We have gathered plants from Orient, Washington — Lamb's Nursery in Spokane — seedlings from Manito Park, and collected plants from northern Idaho. They all vary as to leaf: some are long and slender and widely notched, some are wide and finely notched as in the Manito Park strain. They vary in color from bright green through gray-green to a dull dark green, but all have the same prodigality of bloom. It grows in great patches in the scab rock of Manito Park under pine trees, and is found in similar places north of Spokane. It is especially lovely on the island in Twin Lakes, Idaho. Our oldest plant is six years old. We also have a dwarf form of *fruticosus*, given us by a friend. It grows only 8" high and is fine-leaved, and blooms even more heavily than the type, if possible. Our present plant is only two years old, but we have had this form once before, and lost it due to drouth.

Gairdneri hians is the Penstemon which W.H.A. Preece calls the finest rock plant in existence. Its leaves are needlelike and gray on pinkish-brown stems, and the lovely lavender bells with white throats are large and widely flaring. Of three plants we were able to establish only one, and that died soon after due to drouth. We now have five seedlings in the garden, this time in light shade.

Menziesi, growing at the farm, made a perfect mound of dark green foliage and bloomed sparsely with purple bells. It lived three years, and died from sun scorch in March. I believe it will always need protection in this section. At present we have plants of a form with lighter green leaves and more



Drew Sherrard

Penstemon cardwellii

spreading growth which haven't bloomed yet, as they were set out only last spring. This light-foliaged form grows faster than the mound-like one, and a friend tells me it is a fine ground-

cover for steep banks.

Rupicola and "*rupicola* hybrid" were also set out last spring. *Rupicola* spreads on the ground and is growing nicely. The hybrid is an upright plant



George C. Stephenson

Penstemon fruticosus form at Rock Spur, Oswego, Oregon

of 5" with gray-green leaves and light magenta flowers. It bloomed in June and again in September, the first time I have had an early-blooming *Penstemon* repeat in the fall. "*Salmon-lasac*," a hybrid of *rupicola* and *rich-*

ardsoni, is one of the earliest to bloom, sharing honors with the dwarf *fruticosus*. It grows 10" to 12" high, with long-lasting flowers, darker than the those of *fruticosus*.

Thompsoniae is a new one in our



George C. Stephenson

Penstemon menziesi and *P. menziesi davidsoni* (right)

garden, just one year old, a gift from Amel Priest. It is a tiny-gray-leaved creeping shrublet, looking much more like a *Sedum* than a *Penstemon*. It blooms in small loose sprays, the bells very small and a vivid blue, darker than medium. It would be a rock garden treasure even if it never bloomed.

The shrub *Penstemons* are easy to acquire because many such as *fruticosus* and *gairdneri hians* come readily from seed. (*Penstemons* are the only kind of shrubs I have been able to raise from seed.) Both *thompsoniae* and *menziesi* root as they creep along, so that plants are easily increased. If branches of dwarf *fruticosus* and *barrettiae* are pegged down in summer and covered with soil, new roots will have formed by spring, and a new plant is ready to set out. I have not tried this method with others yet.

There are still other species we find very worthwhile and wouldn't want to be without. *Tolmiei* is a lovely one with clusters of small dark blue flowers with rose throats, the most popular with visitors. *Paysoniorum*, only one year old and with eight spikes of beautiful blue bloom, brought exclamations from every visitor, too. Our favorite red is *barbatus*, and then there is dark purple *aggregatus* and *venustus* whose every spray of leaves is crowned with a spike of large flowers. One form of *procusus*, almost the color of *tolmiei*, but half again as tall, is also a fine plant.

We are always trying new ones, this past year some California species. Among plants of *bridgesii* was one yellow variant, perhaps coral yellow best describes it. When stems were cut and brought inside, the blooms opened soft

yellow. Coming from elevations of 4-7,000 feet from California to Colorado, we hope it will like our sunny bank. The stems grow from 18" to 20" long, but about 10" of this length lie flat on the ground with the rest turning upward, so it can be used in rock gardens. Like so many of its clan, it bloomed heavily with an unbelievable number of spikes on each plant.

Still other Penstemons we have grown and lost, and still regret. The lovely red *torreyi* bloomed and brought hummingbirds to our garden, then died. We loved the dark purple bloom of *albertinus*, destroyed by stock at the farm, and must have it again. We failed with *montanus*, but hope to try it again some day. It was our pleasure to see *ellipticus* blooming in Logan's Pass in Glacier Park last summer, very lovely but not blooming as freely at that height.

Many new plants were put in the garden last fall, and there are still others to try, such as "*Six Hills Hybrid*," *davidsoni*, and "*Editthae*." As you can easily see, we are very partial to the shrub Penstemons, for they are long-lived and add much beauty to the rock garden.

Favorites in a Botanic Garden

PERCY C. EVERETT, *Calif.*

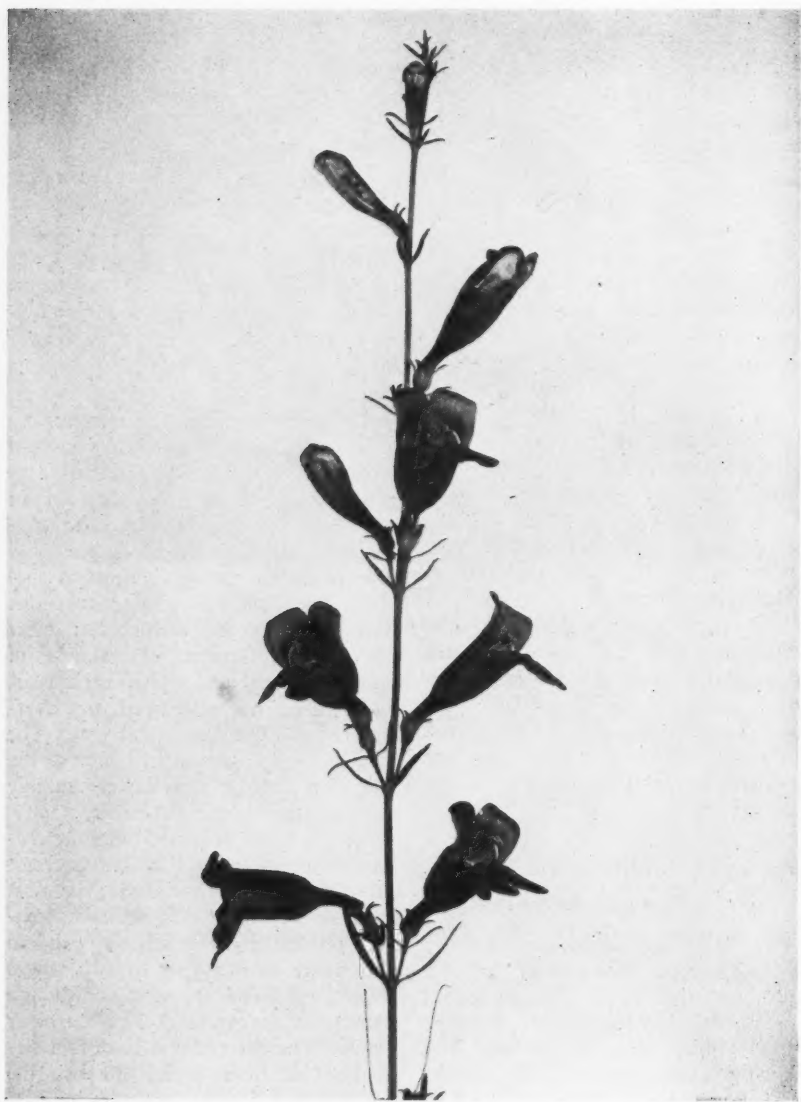
(Taken by permission, from a paper on Californian Penstemons in "El Aliso," Journal of the Rancho Santa Ana Botanic Garden, by Mr. Everett, Superintendent of the Garden. The following notes concern a few species which have proved most successful in cultivation at the Garden.)

California is blessed with a large proportion of Penstemon species, which, during the late spring and summer, add much welcome color to nearly

all parts of the state. During the past 22 years, we have grown 43 species and varieties at the Garden, totaling many thousands of plants, the greatest majority successfully, but we have had failures, too.

P. azureus is one of the best blue Penstemons for rock gardens and low border plantings, and is one of the hardiest types, tolerant of most types of soil, and liking a moderate amount of summer irrigation. Seed germination is only fair, but plants are easily handled thereafter. Its variety *angustissimus*, taller with light blue flowers, is one of the most satisfactory we have grown. *P. heterophyllus* blooms from April to July in the wild, and is successfully grown and appreciated in most parts of the country. Its subspecies *australis* is the most successful here of all the native Californian species. The first has gaping rose-lilac flowers, while the second has clear pinkish-rose flowers. Thousands of volunteer seedlings appear each year, and where not disturbed or overwatered will live for several years. The variety *purdyi*, named in honor of the late Carl Purdy, has flowers mainly deep gentian blue. *P. laetus*, a subshrub, is often confused with *heterophyllus* in writings and is most successful of the lower forms. Under the most adverse conditions this plant has carried on for many years, but seldom lives more than a year or two where water is applied frequently, although volunteers appear to replace the older plants. The rarer albino form is easily grown, but less useful because the white flowers turn brown upon maturing.

P. cordifolius, appropriately called the Honeysuckle Penstemon, is most useful and effective on a partly shaded bank where one can look up and get



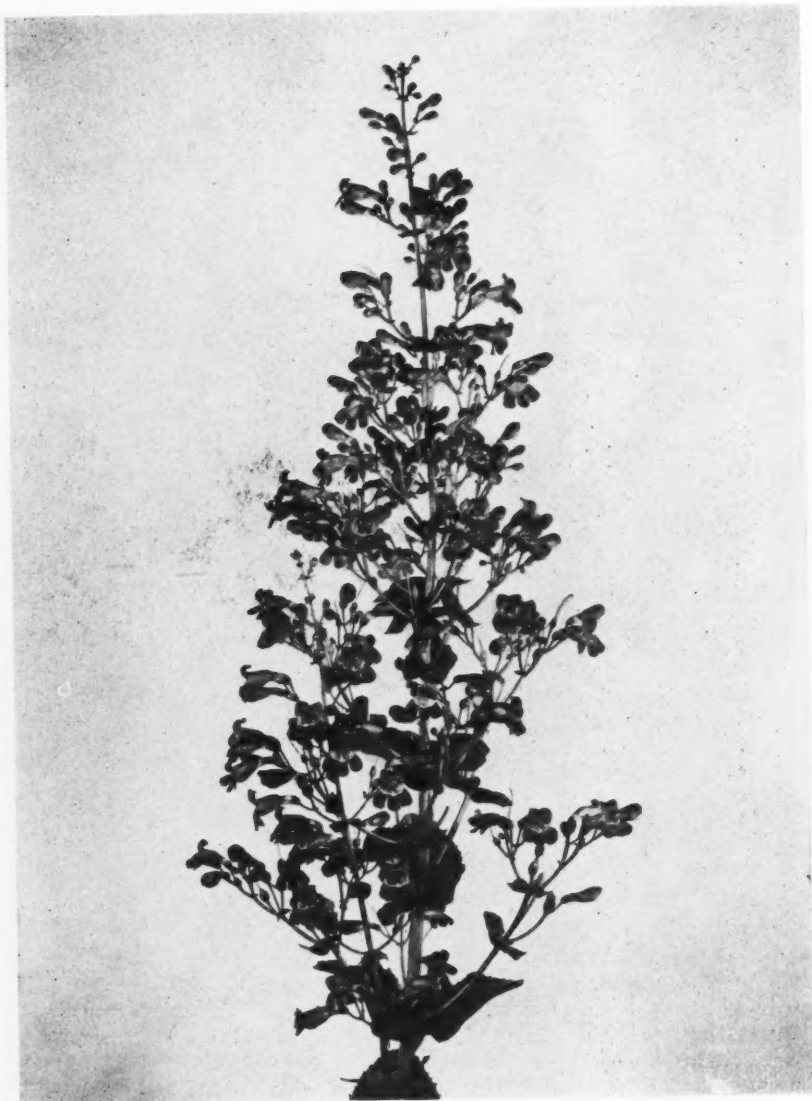
M & M Carothers

Penstemon heterophyllus



M & M Carothers

Penstemon heterophyllus



M & M Carothers

Penstemon spectabilis



M & M Carothers

Penstemon spectabilis

a better view of the drooping scarlet flower clusters. It is easier to get plants by letting the seeds drop than to try to grow them in the nursery, where they need careful watching. The beautiful red-flowered *P. eatoni* is rare here in California, but its more abundant form *undesus* is little different. An inhabitant of dry gravelly slopes, it does best when given such conditions. We now have clumps a foot or more in diameter with flower stalks 2-3 feet tall. The small-tubed scarlet *labrosus*, close to the Mexican *barbatus*, is a hardy long-lived plant preferring light shade and a little summer irrigation, in rocky humus soil.

A most attractive *Penstemon* is *P. thurberi*, much like *ambiguus*. It is an intricately branched bush, 1-2 feet high and equally broad, with hundreds of small, salver-form lavender-rose or clear rose flowers. It is found in open sandy ground, and although plants have not lived long in general, one survived over 8 years until cultivated out by mistake. This plant died back completely each year, to reappear vigorously each spring after its winter dormancy.

Of the taller kinds, *P. spectabilis* is probably the showiest, although not one of the most popular, due no doubt to its inability to withstand much moisture and frost, but it maintains itself here by hundreds of volunteers. It may reach 5 feet in height, with three-foot stalks of lavender-blue flowers. *P. palmeri*, its whitish flowers suffused with pink and lilac, and faintly fragrant, needs warmth and lots of it, and above all, perfect drainage. Seldom does it live more than two or three years, being long-lived only when kept very dry in summer, in rather sterile rocky soil. *P. clevelandi* is also a dry-land species, and no water should be applied during summer months. Many of

our plants are now 10 years old, and each year cover themselves with myriads of crimson to red-purple flowers.

Several interesting hybrids are known. $\times P. parishii$, a cross between *P. centranthifolius* and *spectabilis*, has red-purple flowers, and is found in the wild and in the Garden, wherever the two species occur together. The first generation is not particularly attractive, but seeds from this cross often produce vigorous plants with quantities of brilliantly colored flowers, varying greatly in shade and shape. Another natural hybrid appeared in the Garden, a cross between *P. palmeri* and *spectabilis*, 2-3 feet tall, with lovely deep pink flowers. It was named $\times P. bryantae$, but the original has long since died out, and among second generation plants none is as beautiful.

(The following is a very brief digest of cultural notes from Mr. Everett's paper.)

A porous, well-drained soil mixture seems to be one of the essential parts of any *Penstemon* garden. Species from arid sections prefer little or no summer irrigation. We have found that *Penstemons* will stand a small amount of summer watering, which keeps them looking better, but generally they are rather short-lived if given frequent irrigation, especially if the soil is heavy and the drainage poor. Monthly irrigations will suffice for established plants of most species, and less often for those from desert areas. Except for the higher mountain and cooler region species, most of our *Penstemons* get sun a large part of the day. Insects and diseases have given us comparatively little trouble, and only on certain species. Over-watering in heavy soil will cause root rot, but this may be kept in check by keeping plants on the dry side.

Penstemons of New Mexico for the Garden

GLADYS NISBIT, *New Mexico*

Of the forty species and subspecies of Penstemon found in New Mexico only a few of the most choice for garden cultivation will be discussed here. Many other Penstemons of the Southwest are charming, each in its own way, and add beauty to the plains and mountains.

Most common among the red-flowered Penstemons of this area are *P. barbatus* and the subspecies *torreyi*. *Barbatus* is too well known to need description. It grows well under cultivation but is rather unpredictable as to color, and the stems usually require support. *Torreyi* stands up better and does not fade out so badly. One of the most attractive red-flowered species is the small woody *P. pinifolius*. With its bright scarlet flowers rising above a mat of short needle-like leaves, it is truly a picture. It should be a favorite in the rock garden. *Pinifolius* requires full sun, good drainage, and probably some limestone in the soil. Since it is native to mountains 8,000 to 10,000 feet, it should stand most severe winters.

P. cardinalis and subspecies *regalis* are found only in the mountains of south central New Mexico. These are attractive plants with shiny green leaves and crimson to purplish-red flowers about an inch long. They prefer rocky ridges and are found growing under the pines, spruces, and firs. I had a plant of *cardinalis* several years ago, but it winter killed during severely cold weather without a snow cover, which would indicate protection is needed.

P. superbus is at home in the rocky canyons and sandy washes of southwestern New Mexico and south-east-

ern Arizona. It is rightly named *superbus*. The tall plants with large glossy leaves and the long inflorescences with many brilliant scarlet blossoms are beautiful. *P. parryi* of southern Arizona, *P. alamosensis* found in the Sacramento Mountains of southern New Mexico, and *P. wrightii* of the Jeff Davis Mountains of western Texas are closely related to *P. superbus*. All are worthy of garden cultivation, but probably cannot withstand severe winter weather.

Among the glaucous-leaved, blue, spring-flowering Penstemons, *P. angustifolius* subsp. *caudatus* is a most satisfactory garden plant. It is very hardy, a profuse bloomer, and will bloom again in late summer if the spring blossom stalks are removed. The color varies from pink to lilac and sky-blue. *P. secundiflorus* is a darker blue than *caudatus*, not so erect, but very nice.

P. strictus is another blue to violet Penstemon that makes a nice showing in the garden. It is quite tall, one and a half to three feet, and slender stemmed, but stands up well, only occasional stems falling down. *P. brandegei* is one of my favorites although the stems require some support because the many large blue to violet blossoms are so heavy. One of my plants this year had over fifty flowering stalks. It is very hardy and re-seeds nicely. Some forms of *P. virgatus* should make attractive garden flowers. This species is very variable in flower color and size and in other characteristics. While many plants bear unattractive pale lavender flowers, I have found very nice pink forms, good whites, and true blue. Whether they will hold these colors under varying conditions or come true to color from seed, I do not know.

The different subspecies of *P. linear-*

ioides and *crandalli*, found in the mountains of New Mexico, Arizona and Colorado, are particularly attractive for the rock garden or as border plants. They are narrow-leaved and the flowers are small usually a beautiful bright blue. These plants seem to be difficult to raise from seed but transplant from the wild easily.

Varieties of *P. rydbergi* and closely related *Penstemons* grow all through the Rocky Mountain area. The New Mexico form makes a lovely garden plant. The dark blue flowers are small but closely packed at intervals on the stem, and the leaves are a fresh bright green. Since it normally grows in mountain meadows, it is adapted to good garden soil.

One of the nicest *Penstemons* to use as a border plant is *ambiguus*. It is somewhat woody, much branched, with small narrow leaves and many dainty flowers that are pinkish externally but have flaring lobes that are glistening white. My plants this summer bloomed from early June to late August. *P. ambiguus* varies in height from ten to thirty inches, the taller forms requiring a longer hotter summer than the shorter forms. This should be a garden favorite wherever a sandy soil is found.

P. pseudospectabilis subsp. *connatifolius* is a beauty, but may not be hardy where winters are severe. It is native to mountains of southwestern New Mexico and southeastern Arizona. *Connatifolius* grows in large clumps often over three feet high, much branched, and with the exceptionally long inflorescences covered with inch-long pink to rose flowers. It prefers rocky or gravelly soil and good drainage.

One of the most beautiful of all *Penstemons* is *P. palmeri* of central Arizona. It is a typical semi-desert plant and unique in that the blossoms have

a delicate fragrance. It sometimes grows to a height of four or five feet with hundreds of white flowers tinged with pink. My plants survived the first winter, bloomed not too profusely, and winter-killed the second year. I am trying again and hope to find some way to carry them through the severe winters.

Penstemons of the Northern Great Plains

MYRTLE HEBERT, Montana

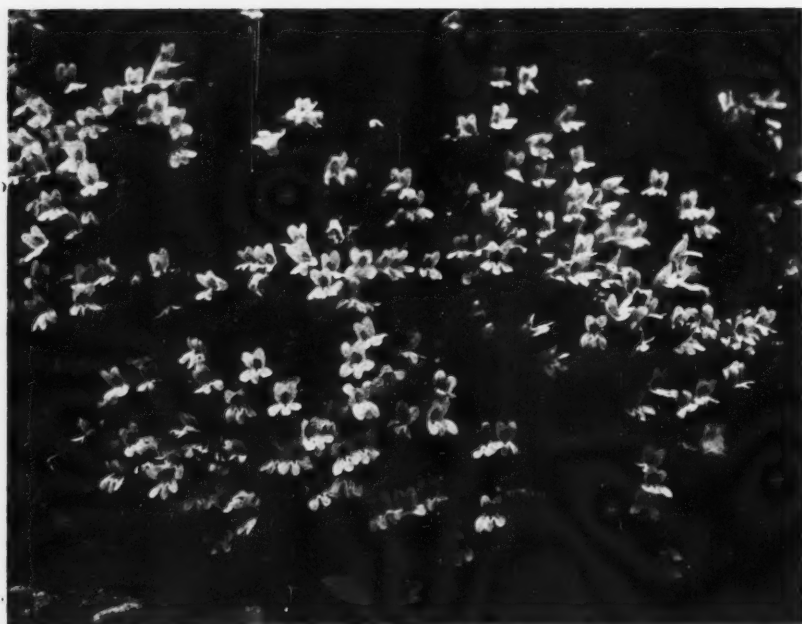
The *Penstemon* family is a large one, its members differing widely in the various sections of the country—so widely that at first glance, the amateur scarcely recognizes some of them as *Penstemons*, though closer investigation soon shows the family characteristics. The northern Great Plains region has many lovely native *Penstemons*, with perhaps some of the purest blue tones to be found in the entire family. With a few possible exceptions, they show a marked preference for sandy soil and the points of hills and steep banks where the drainage they require is assured.

May and June bring a great display of *Penstemon* bloom in favored localities. *P. nitidus* is one of the first to paint the hills blue, but many others of the *Coerulei* group are also plentiful—*PP. acuminatus*, *angustifolius*, *arenicola*, and *polyphyllus* (generally classed as a form of *nitidus*)—all early and lovely species, some of them just being introduced into gardens. These can be recognized by the glaucous bluish leaves, although the leaves vary from the linear *angustifolius* to the spatulate form of *grandiflorus*—too well-known to need description, and lovely in either the original lavender, or in the pink or pure white, the latter an especial favor-



G. Nisbit

Penstemon angustifolius subsp. *caudatus*
Open hillside, Springer, N. M.



D. M. Andrews

Penstemon caespitosus

ite. *P. secundiflorus* is also in this group and has proved very popular and adaptable to the garden, with tall graceful sprays of bloom.

P. glaber is one of the most abundant and dependable Penstemons of this area, and many of its near kin in the Glabri group are either native in this section, or so easily transplanted from a little further south as to fall into that category. This group has glossy lanceolate leaves for the most part (though there are exceptions) and a very robust habit of growth. *P. glaber*, the species for which the group is named, grows from 1-3 feet in height, depending on soil and moisture conditions. It has many spikes of large bells, varying through tones of blue and purple, many showing reddish tones in the throat, but select strains have a deep rich blue.

P. brandegei resembles *glaber* very much but is somewhat heavier and huskier in growth. The color in the best strains is a pure sky blue with milky white in the throat.

P. comarrhenus is very different from the above species—light and airy in appearance, the whole plant graceful and light. The bloom stems are tall, the leafage sparse, and instead of heavy spikes of bloom, it has a daintier form, each individual flower being poised on a pedicel. The color is a rather light blue on the lips with lavender in the throat. *P. strictus* in a deep dark blue has a somewhat similar growth habit. *P. speciosus* is tall with wand-like stems carrying many large blooms of a striking electric blue. *P. cyananthus* is another excellent blue which seems to thrive in gardens. *P. unilateralis* has



D. M. Andrews

Penstemon angustifolius

proved an excellent garden subject for many years—tall slender spikes of reddish-lavender bells with deeper veining on the lower lip which accents the color effectively. In lean gravelly soil, this species stands up well and gives a marvelous performance.

There are many others in this group which are becoming established in our gardens, including *PP. subglaber*, *alpinus*, and *garretti*—the last named showing particular promise in my garden—

sturdy and easy, as well as perfectly hardy. Other species in this group are just being introduced from the wild, and only limited information is yet available on them. This *Glabri* group seems especially suited to the conditions in our gardens, where extremes in temperature, long periods of scant rainfall, and almost constant wind, demand a rugged constitution.

Less easily domesticated but equally lovely are some of the *Aurator* group



D. M. Andrews

Penstemon secundiflorus

with rough grayish foliage in rather inconspicuous mats. *P. eriantherus* with its large lavender bells and conspicuous golden bearded tongue is striking in the wild, and under favorable conditions may be grown successfully in the garden. It prefers a rock garden, and very sandy soil—lacking that, a generous addition of gravel or cinders to the soil, combined with super drainage,

helps give the conditions it needs. Also native here is the white *P. albidus* which is less demanding in its cultural needs, and also less showy, with smaller white blooms often tinged with pink or lavender. Not much data has yet been collected about the other species in this group.

In the wild, these *Penstemons* all seem to have a well-laid plan of devel-

opment. They start into vigorous growth as soon as the snows leave in the spring—sometimes before they are gone—and rush into a profusion of bloom that is almost unbelievable. The spikes of bloom seem all out of proportion to the small plants that produce them. The period of bloom is not long with most kinds in the wild. In the garden, the bloom does not start quite so early in the spring, but seems to extend much longer into the summer. They are inclined to seed so heavily that many plants fail to recuperate from the heavy tax on their vitality. After ripening seed, the plants go into a semi-dormant state and make no growth until the fall rains encourage new growth. They seem to need this period of rest, and in cultivation, it seems advisable to duplicate the natural conditions as much as possible. It also seems best to remove some of the fading bloom stalks to prevent the over-heavy seed development. Many kinds produce a second crop of bloom if the seed spikes are removed, and the season favorable.

In contrast to cultural practices in milder climates, I have not found it advisable to give plant food or fertilizer in the fall to stimulate new growth. It has a tendency to encourage rank fall growth which may suffer drastically when severe cold strikes. Neither do I believe a heavy mulch is advisable, as the plants show a tendency to rot off at ground level. Ashes, gravel, or possibly sawdust, will serve to protect the plants from winter heaving and root damage, and are advisable. This section is generally blessed with an ample snow cover which solves the problem of winter protection, and when snow is scarce, the winter losses are proportionately heavy. The heaviest losses in the garden generally come during that transition period between winter and spring, when alternate freezing and

thawing put such a strain on the plants, just starting into growth.

It seems a simple matter to transplant these native Penstemons, even when dug full of bloom. They make a heavy root growth and it is generally possible to take them up with a ball of dirt. Last summer, on a trip to Wyoming, I secured plants of *PP. nitidus*, *albidus*, *glaber* and *eriantherus*. They were dug with a ball of dirt, wrapped in paper, and stowed away in my suitcase. Two days later when I unpacked them, they were fresh and pert. *P. nitidus* and *eriantherus* had just finished blooming, while *P. albidus* and *glaber* were just developing bloom stalks which grew perfectly and bloomed as unconcerned as if still in their native Wyoming. I have also moved Penstemons successfully during their dormant period.

Quite different from the species already discussed are the Penstemons of the Rockies. The Fruticosi group is well represented, sometimes carpeting rock slides or clinging to crevices, seemingly happy in the most desolate looking spots. They are particularly adapted to rock gardens and natural banks, forming spreading mats with woody base stems, and generally small heavy-textured leaves, often serrate. The flowers have woolly anthers, and come in many colors, including red, white, and more commonly shades of lavender, blue or purple. The blooms are borne singly or in open panicles rather than the spikes or heads common in other groups, and are produced in great profusion. There are many choice types in this locality—some in other groups—and varying from wee plants at home in a chink between rocks to the other extreme of great spreading mats that cover large areas. But these must of necessity be

described by one more familiar with them.

Various types of *P. procerus* are found both in the hills and in the mountains proper. These are little cluster-heads, leafy plants with small bloom heads in mint-like form, and ranging through all shades of lavender and purple, or sometimes the deepest of pure blue. They range in form from tiny plants (such as *P. aridus*) which resemble the mossy phloxes with mats of needle-like leaves, to taller forms suitable for the regular border. Their season of bloom varies, depending on altitude—early June on the prairie, late July in the mountains. These are not showy, but are easy to grow and often seem to fill a special need, such as edging the border.

This article is concerned primarily with Penstemons native to this section, but it might be well to mention that many introduced from other regions have also proved adaptable and made welcome additions to the native kinds. *P. barbatus* in its many forms is one which has become common in our gardens, and there are many others. There have been surprises, some happy ones and some otherwise, but among the happy kind was the discovery that some of the Spectabiles group could survive a northern winter and give a good account of themselves. *P. palmeri* with pale pink pouched blooms—*P. clutei* which has proved especially happy in my garden, and which has a distinct indescribable bright color with pink and orange tints—and *P. rubicundus* which has not yet bloomed—have all wintered without cover. All these have silvery green foliage with sharply serrulate edges. Others which have been grown successfully and have proved attractive in cultivation have not even been mentioned, but lack of detailed information makes it impossible to describe them or their culture adequately.

Natives of Nebraska

CLARA BANGS, Nebraska

Penstemons are among our loveliest wild flowers, and they deserve special attention from gardeners because it is a great challenge to grow them successfully. June is the season for their glorious display of bloom in this area. Nebraska has ten native species growing in our prairies and along the railroad tracks, and all but one are suitable for borders and garden beds in general.

The odd species is *P. haydeni*, a sprawly plant which grows, of all places, in blowouts in the sandhills. It will grow in gardens, however, perhaps classed as a novelty for its odd sprawling habit, but well worth the space it needs if you like odd plants. The blossoms are nearly white, faintly tinged with blue, and held in dense clusters at the branch ends. They are said to be slightly fragrant, an honor in this great family which is shared only by *P. palmeri* in the southwest.

Grandiflorus is our most popular Penstemon, lavender or light purple in color, and very plentiful in sandy soil areas. It is easily transplanted, even in full bloom. Both pink and white forms have been found which are very beautiful and add much to the garden value of this species. The white ones come true from seed, but not the pink. As children we called these "thimble flowers" as we pulled off blossoms and put them on our fingers for thimbles.

Cobaea is the largest flowered of all, very lovely, but not so plentiful as the others. Its blooms are similar to Canterbury Bells in size, tinted white or lavender to rich purple. *Eriantherus*, sometimes listed as *cristatus*, is a beautiful and generous bloomer, with plants growing a foot or more tall in sandy gravelly soil. The flowers seem large for the size of the plant and have a

fuzzy appearance, pinky-lavender in color with golden stamens sticking out of the "mouths."

Glaber is our "great big beautiful blue one," one to two feet tall with flowers fairly packed along the stiff stems in one-sided spikes. There is a pink form, but the color is not as good as the blue. This is one of our loveliest species, very showy and easy to grow, and a true perennial if the location suits it. *Digitalis* is well-known to most of us and a favorite, for it is easy to grow, and stands tall and vigorous on stiff stems through all kinds of weather. Its great panicles of white or tinted blossoms are very good for cutting. The pointed seed-pods of this species and others are also very pretty and useful in dry arrangements, either painted or left in their natural reddish-brown. This is a true perennial with large basal rosettes of rich green foliage which turn red and purple during the winter.

Angustifolius is the daintiest of our natives, and also the earliest, blooming in May. It is a great favorite, growing less than a foot tall with small narrow leaves and sky-blue blossoms. It grows in sandy soil, and we found a colony once along the railroad growing in pure cinders, the plants small but the blossoms like bits snipped from a summer sky. They died promptly when we planted them in ordinary garden soil.

Acuminatus is similar but the foliage is different, the leaves long and sharply pointed, and it blooms a few days later, the same lovely blue or sometimes pink. We found a large colony of this while on a fishing trip, growing beside the railroad tracks and across a sandy pasture as far as we could see, a sight never to be forgotten. The plants we brought home lived for several years and bloomed profusely, both pink and blue.

Albidus is a gem for rock gardens and low borders, with small flowers,

some pure white, others tinted, and all lovely. It grows on the tops of low hills or on banks along the road, and must have a well-drained location in the garden. *Gracilis* is a slender plant with narrow leaves and light blue or lavender blossoms in panicles. It is not a common species here, but is listed for western Nebraska, growing in moist prairies, and I hope to find it sometime.

These Penstemons do not like being crowded in the garden, and they will not endure wet crowns. They never grow that way in the wild. Each plant stands by itself, and always on a raised location, never in a low place where water might stand. The oldest plant in our garden is growing in a gravel-pile with roots going down into the soil beneath. It is seven years old now, and blooms profusely every summer.

Penstemons may be divided like other perennials, and also grow easily from cuttings. Pieces pulled off the side of a plant, if taken early in the spring and set out in the open, usually bloom along with the parent plant, in this region at least. It is best to snip off the faded blossom stalks to save the strength of the plants unless seed is wanted, for plants must make new basal growth to survive the following winter.

Many other Penstemon species do well in gardens here. Round-robin members in this and surrounding states are growing them successfully, some in borders, some in foundation plantings and in front of shrubs, and two gardeners report colonies growing in open woodland. I enjoy trying species from other areas in beds or as groups in the border where they are very showy and nice, and much enjoyed by visitors. A bed of seedlings is also an interesting study in different foliage. Penstemons add much variety of color and interest to our gardens, and I love them all!

At the Four Corners

FLORENCE THOMPSON, *Missouri*

Your map will show where the four corners of Missouri, Kansas, Nebraska and Iowa meet. In the area surrounding this point and spreading outward for many miles, many species of Penstemons may be grown just as easily as other perennials. In this region there is usually plenty of spring moisture while plants are blooming, then dry weather during July and August. Described in this article are several beautiful species, and all they ask here is a place in the sun, good drainage, and a little well-rotted manure or bonemeal worked into the soil before planting.

Topping the list is the lovely *P. cobaea* with its huge lavender bells, and its dark purple Ozark form. These bloom from seed the second year, then some will die out like other Penstemons, while others will make vigorous new growth. When these plants are two or more years old, with several spikes of bloom, then is the time when you may be sure garden visitors will stop short in their tracks to admire the beauties.

Another showy large-flowered species is *grandiflorus* with its tubular hanging bells of lavender, pink and white. Plants are best set closely together as they are tall and slender. My favorite garden planting is pink and white *grandiflorus* with white *Hesperis* in the background, and an edging of variegated oatgrass. *P. murrayanus* is also easily grown and this too should be spaced closely. The bright red flowers last a long time, and the blue connate leaves add much to the beauty of the plant. Then there is *digitalis*, the tall white-flowered one like perennial phlox which flourishes like a weed here, but is not to be despised.

If you live in the midwest, try this: Select a high dry place in your garden, spade in a little well-rotted manure, and then make a planting of *murrayanus*, *digitalis* and *cobaea*. The south side of a shrub or hedge is a good place, with the Penstemons set several feet in front of the shrubs. Use several plants of each, placing *murrayanus* at the back, then stagger single plants of *digitalis* in front, with clumps of *cobaea* at either end. For a neat green edging, use English sweet violets.

The red *barbatus*, commonly called firecracker plant, and its pink and coral varieties, are well-known here. The new *grandiflorus* hybrids and the mysterious "*Flathead Lake*" grow well, with white *digitalis* for a good background. Next spring I hope to have white pansies in front of the pink "*Flathead Lake*," lavender and purple shades with *cobaea*. *P. ovatus* has many racemes of lovely small dark blue flowers, and its foliage is attractive all summer. Try this with tall yellow iris and yellow columbines, with fragrant yellow wallflower for edging, all blooming at the same time. Or try any mid-season or late-blooming white iris behind blue *ovatus*, with orange-red Oriental poppies at each side.

Several of the early-flowering, low-growing species such as *nitidus*, *angustifolius*, and *albidus* may be successfully grown here, but tend to be short-lived unless super-drainage is provided along with a gritty top-soil. It is all right to have some food at their roots, but around the crowns and for a couple of inches below they seem to like some air, hence the gritty soil. A mulch of stone chips will help keep them from heaving in early spring. The eastern species, *hirsutus* and *canescens*, are also perfectly at home in this region,



McFarland

Penstemon grandiflorus

and species from the South-west have bloomed well.

P. secundiflorus in lavender and uni-

lateralis in pinkish-lavender are similar in bloom, although belonging to different groups. Both have long, one-

sided spikes of closely packed flowers, and should be grown in full sun, as they tend to lean in part shade. A well-grown bushy plant of either species is a thing of beauty. *Glaber*, *brandegei*, and others of this group have heavenly blue coloring in their flowers, and good shining foliage. They too must be in full sun, not crowded by other plants. For another lovely garden picture, plant *P. torreyi rosea* in salmon-pink behind a clump of blue *glaber*. Make all Penstemon plantings in September if possible. Then the following spring, enjoy to the full the beauty of this little-known, truly American wild flower, the Penstemon!

Beginner's Luck in the Ozarks

MATHILDA BERNARD, *Missouri*

A tiny seed of *Penstemon barbatus* in a packet of mixed perennials introduced me to the glorious Penstemons. In order to learn more, I joined the Penstemon Round-Robin, the members of which later organized the Society. There was much to learn and not much spare time, and for two years I had almost complete failure in our poor soil and intense sunshine. But the following year showed many varieties in my rock-terraced garden, and the list of those tried is constantly growing.

The second species I met was *P. hirsutus*, considered not very showy. The first season, only two flowers appeared on the single stalk, but each year the plant became more floriferous. One year a plant produced 38 flower stalks, after having been watered through a drouth, but it died after bloom, while other plants without water bloomed less profusely and survived to bloom again. These stubborn little fellows with protruding chins always amuse me. It is a delight to watch the bum-

blebees crawl into the tightly closed lips, sip the nectar, then swing to and fro on the lower lip upon emerging. After a few days, the lips stay open. *P. pygmaeus* differs from *hirsutus* in that the short flower stems, instead of being erect, lie flat on the ground. The flowers are often so pale as to be almost white, producing the effect of a dancer curtsying, with the scallops of her white petticoat protruding from under her dark green satin skirt.

P. arkansanus I found to be a native here in open woodlands and along roadsides. Its season varies from late April to early June, but always the same time as my rose peony, so I have planted it beside the peony, a pretty combination of rose and white. The flowers are small, white with purple lines which at close range give it a muddy appearance, but at a distance they appear snowy white. It reaches just below the chin of the peony, and might be a white jabot worn by the rosy-cheeked peony-maiden. It usually lives only two years but I can always go to the orchard or woods for another. One year only a few bloomed here and there, and as always our hay crop was very short, while the following year, after the roadsides had been white with splotches of Penstemons, we made plenty of hay, confirming the old saying of western cattlemen—"When the beard-tongues disappear, grazing will be poor."

It took *P. cobaea* two or three years to become established, and I wonder if it likes more moisture than some others. After good rains, the plants doubled and tripled in size. Its lovely large bells of royal purple sprinkled with silver are worth every effort. *P. grandiflorus* usually dies after blooming, but I keep it going by sowing fresh seeds each year.

The most glamorous I have met is

P. subglaber. A one-year plant had 24 spikes from 18"-30" tall, solidly packed with the purple-tinged blue flowers. It was a beauty, every bit as lovely as a delphinium. *P. unilateralis* was almost as showy although it had only two spikes and passed on without setting seed. *P. comarrhenus* is a lazy little imp, decumbent and reclining against a sloping rock at the edge of my wall. It completely captured my heart with its light blue, open-mouthed flowers, widely spaced on long pedicels, swaying to and fro in the breeze. Are they gaping at the wonders of the world, or only laughing at the funny little woman passing by?

The red-flowered "*Flathead Lake*" resembles *P. barbatus* somewhat, but instead of having long stems that flop, it stands erect, only 12"-18" high, and is more floriferous. *Garnet* takes the prize for longest bloom, from mid-June to early October. Planted at the edge of the wall against a large sloping boulder, most of its flopping stems rest on the rock and then ascend, with a few hanging over the wall, loaded with their large wine-colored bells.

Each year finds new ones added, although not all will stay with me. This year I have seedlings of several California species. Will they survive our Missouri winter?

Notes From Eastern Ohio

JAMES ELY BRADFELD, Ohio

Of the many eastern species, *Penstemon digitalis* and *hirsutus* are natives here, both hardy and long-lived, while *canescens* and *smalli* are perennial but not so long-lived as *digitalis*. This last is very attractive and no doubt would be appreciated more if it were not so common in wet meadows and hayfields, where it is almost a

weed. *Hirsutus* lacks good color in its wild forms but does produce a mass of flowers for a distant effect, while *canescens* is taller with better color. *Smalli* is my favorite so far in the Graciles section, my original plant having been collected at Blowing Rock, N. C. The flowers are larger than those of *digitalis*, borne in dense clusters, a soft pink color with lighter throat and white lips giving a definitely white face, but markedly different from *hirsutus*. Plants grow two feet tall or less with smooth foliage, and they have an added attraction of flowering a second time in the same year. These eastern species are all resistant to the diseases which are a definite handicap to the showier western species.

For the past two years the weather in this part of Ohio has been excessively wet, and the western species, adapted as they are to a dry climate, have suffered from two serious diseases, one a Sclerotium fungus, confined largely to the non-shrubby species, the other a bacterial rot, worst on the shrubby types which I have just begun to grow in the past year.

When they do well, I cannot speak too highly of the western Penstemons. *Barbatus* and its forms give an outstanding performance, the plum purple form being one of the hardiest, forming clumps with up to 40 wand-like spikes, about two and a half feet tall. *Torreyi* is also very hardy, orange-red in color. *Barbatus* "Rose Elf" and the new "*Flathead Lake*" are pink-flowered and variable in height, and seem to be more susceptible to disease than the other forms.

Some of the prairie and Great Plains species do well here although they are not yet proved long-lived, and disease is serious at times. *P. cobaea* deserves to rank with the best garden plants. Flowers of very light lavender, borne



Josephine de N. Henry

Penstemon smallii

on rigidly stiff stems two feet tall, make the plant a thing of unusual beauty for almost a month. Flowers of *grandiflorus* are almost as large and similar in color, on stems up to three feet tall, but they last only about eight days so there is no comparison as to desirability. The Fate hybrids start flowering as the stems reach about two and a half feet, and continue until they are five feet tall, with colors ranging from white through pink and purple to intense velvety reds. Fungus disease is their worst enemy.

Determination of the various species in the large Glabri group is very troublesome to say the least. They all have lovely flowers in shades of blue and related colors. The state of the weather seems to determine the color for me—the drier the weather, the bluer the flowers. They may start at the bottom of the spike as rosy purple; if no rain falls, later flowers are in-

tensely blue; rain falls again, and the last blooms are once more rosy-purple.

Of those tried, *unilateralis* is the tallest, with stiff three-foot stalks of large tubular flowers characteristic of all the Glabri. *Speciosus* is similar with more closely packed spikes, and flowers a little smaller, but to all practical intents and purposes the same. *Glaber* shows tremendous variation, some plants presenting a lovely picture of stiff 18" stems and deep blue flowers, others with very poor habits of growth. *Brandegei* has large flowers of lovely blue, but stems sprawling all over the place so that it is hardly worth growing here. Individual plants have proved perennial but not really long-lived. By saving seed and scattering it in winter, it is possible to keep many plants coming along in the garden.

Of the Spectabiles, I have tried only *palmeri* long enough to make a positive statement. Some plants may be



Josephine de N. Henry

Penstemon murrayanus in the Southern Garden at Gladwyne

brought through the first winter and will bloom with wand-like spikes of large tubby flowers, but then disease will get the survivors and they will die. Year-old plants of *clutei*, *spectabilis*, and *pseudospectabilis* seem healthier than plants of *palmeri* set out at the same time. The last one has yet to show any signs of trouble, but *clutei* has a strong tendency to succumb to disease.

From other groups, red-flowered *centranthifolius* shows every sign of great vigor, while *ovatus* is very susceptible to disease and short-lived here. It may reach a height of three and a half feet, and its small dark blue flowers open before the others start.

I have had some interesting results from plants started early in the greenhouse. Apparently some species can be brought into bloom easily in the first year from seed, while others refuse to bloom no matter how much of a start is given them. With these, I imagine the shock of winter is necessary to start the chain of events for flowers. In comparing their health with seedlings outdoors, there is very little advantage even though they are invariably much larger plants. The following list, briefly stated, gives the species that bloomed and the relative percentage, of plants tested: *P. smalli* and *cordifolius*, 100%; *centranthifolius* 90%; and *pseudospectabilis* 50%; then the number drops to only 10% of *triflorus* and *subglaber*, 5% of *hirsutus*, *canescens*, *richardsoni* and various *barbatus* forms, and a scant 1% of the *Fate* hybrids. Of the more than 20 other species tested, including several of the *Glabri*, *Spectabiles*, and *Proceri*, none bloomed at all, although at least 10 plants of each were used, and in some cases nearly 100 plants in two years of tests.

Between the novelty of the plants themselves with their varied forms, and the selection of types that will grow

well here, there is much to be done in introducing Penstemons in this area.

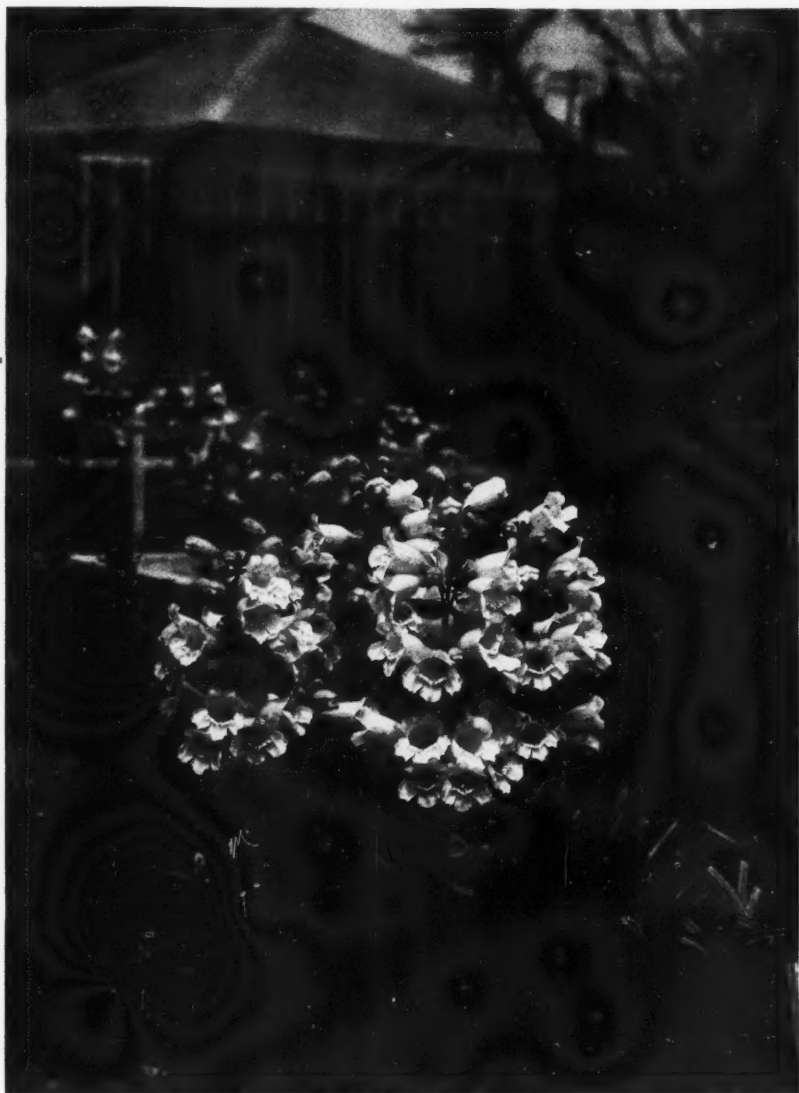
Blue Ribbon Winners From North Carolina

SALENE CHRISMON, N. C.

In growing Penstemons I've had gratifying success and dismal failures, a performance encountered in other plant families. Penstemons are as charming and intriguing as any plant in the garden and just as beautiful. While they do require aggressive effort on our part to keep them happy, the reward gives us deep satisfaction. I realize that some species will never be happy in our garden, as the humidity is terrific during the summer months, the garden low and flat; but there are many that will grow here, and I am endeavoring (through the trial and error method) to locate the varieties that with proper care and study will be more permanent.

In the spring of 1950, the *Fate* hybrids (*murrayanus* × *grandiflorus*) were the high-light in the Penstemon border, receiving favorable comment and high praise from garden visitors. As each of the wonderful colors appeared, I became more and more excited. First came a beautiful clear coral, followed by salmon, wine, lavender, deep maroon, fiery scarlet and a brilliant red, all set off by the large glaucous leaves. While the flowers are smaller than those of *grandiflorus*, showing the *murrayanus* influence, they are thickly studded on the stems, many open at a time, and continuing from May until July, quite a record for Penstemons here.

For several years I have grown *Garnet*, *Firebird* (or *Cherry Glow*), and *Ruby King* in the border, along with *barbatus*, *grandiflorus* and *digitalis*.



The Fosby Studio

Penstemon cobaea

These hybrids may always be depended upon for rich color and abundance of bloom from late May until September. Ruby King is the finest red, with a

distinct white throat—Garnet and Firebird very similar, but Garnet more floriferous. In 1949, Garnet grew 36" high and was never lovelier, placed in

back of double white feverfew and campanulas in a very pleasing garden picture.

P. grandiflorus in three colors has been grown and greatly admired, some years reaching perfection, but always short-lived. *Murrayanus*, 45" tall, bloomed for seven weeks in 1950, with unusually nice bloom stalks. *Digitalis*, while scorned by many as being too plebeian, has proved its worth for the border over and over. The 36" plants produce fine white spikes over a long period. This is such a dependable subject—no crown rot, no coddling, and never lets you down. The long white sprays are also fine for arrangement work.

P. murrayanus, *barbatus*, *grandiflorus*, and *cobaea* are species most susceptible to crown rot, and they must be watched carefully during wet weather. Only once, in 1947, have I grown *cobaea* "Ozark" to fullest perfection. For fifteen days, the huge bells of reddish-purple were so striking that I found myself going out many times daily to catch another glimpse of their beauty.

The *Glabri* group has proved to be one of the best for adaptability—free-flowering and long-lived here (except in extremely wet years.) *Glaber* itself, *unilateralis* and *brandegei* have been grown with success. In other groups, *procerus* has long been a fine garden subject, and Jack Frost usually terminates its second blooming period. *Ovatus*, *whippleanus*, *gracilis* and *serrulatus* (*diffusus*) have also been grown with fair success.

P. canescens and *hirsutus* grow and bloom with reckless abandon, the former being the most persistent-flowering of any grown. The color variations are all pleasing, from clear pink to lavender and various shades of blue, the plants usually reaching 30" in height. The improved varieties of *hir-*

sutus are also in bloom for many weeks. As the flowers fade, I cut the stalks, and a brand new crop appears of the daintiest, tiny, pink and lavender white-lipped blossoms.

For several years I have exhibited these Penstemons at local flower shows, and they are consistent blue ribbon winners. For cutting, they are unexcelled, lasting well for days.

I find that plants grown from seed are easier to acclimate than plants brought in from various sections of the country. Since discovering that many species are short-lived here, I keep them coming by repeated seed sowings. For several years I tried all prescribed methods of culture such as scree in soil—sowing in vermiculite etc.—but experience proved that by sowing seed during the late fall direct into prepared beds (1/3 leafmold, 1/3 garden soil, 1/3 sand), I had almost 100% germination, producing fine stocky plants. Our greatest difficulty is not getting them up, but keeping them coming along afterwards.

Climatic conditions must be considered here also. Some winters are mild while others are quite severe, which would naturally have a bearing on germination, growth, and bloom—which proved a point in 1949. On March 15 I sowed refrigerated seeds of Fate's hybrids which, in the following spring, reached 48"-55" in height. These seedlings were moved the first fall into new elevated beds with only bonemeal and organic compost incorporated into garden soil, and quickly made new rosettes. Most plants have made new growth since blooming. From seeds of "Flathead Lake" sown in December 1949, I had two plants bloom during August 1950, which is a Penstemon record for this garden. I have also used ashes and other complete plant foods in soil, which were



Ralph Bennett

Penstemon calycosus

fine as long as we had light showers throughout the summer, but during dry seasons, unless watered, the plants died.

To become acquainted with a few Penstemons will be an incentive for more. You will not regret having Penstemons in your garden.

The Virginia-Maryland Region

RALPH W. BENNETT, *Virginia*

This region has a peculiar climate characterized by extreme fluctuations of temperature in winter, plentiful, often excessive rains in spring, and high heat and humidity in summer. A mild spell of winter weather may cause Penstemon seeds to germinate prematurely, only to be frozen later. Excessive rains may develop tall weak stems in many Penstemons, and species from

hot dry areas do not like our high humidity. On the other hand, we are spared the parching winds of the prairies, and the insufficient spring rains and intense winter cold of other regions.

If one accepts these limitations, a large range of colorful types can be grown here. In my own garden experience, the principal deterrent to a good display is competition with tree roots, although some Penstemon groups are more tolerant of this condition than others. The eastern species are likely to be most satisfactory in this region, since they are natives of woodland areas, and accustomed to plentiful rains. They have plenty of color, and improved forms are constantly being developed which are much admired by local gardeners. These species, even when beaten down by heavy rains, will usually straighten up again in a few days.

There are two distinct groups of these species, the first comprising tall leafy plants, stiff-stemmed and seldom beaten down, and long-lived. *Digitalis* is like a tall white phlox, *calycosus* varies from pale to deep pink, or a pleasing lavender, and *laevigatus* is much less showy, in pale lavender. These make additions to the border, used like phlox, and are in bloom at a time when color is lacking, just before the summer day-lilies.

Hirsutus is typical of the second group, of medium height, with arching stems, sometimes beaten down in ordinary garden soil, but usually standing erect in scree. Although inclined to bloom itself to death here, it self-sows freely. The new *Gladwyne* varieties are especially pleasing, ranging from pure pink through bright crimson to rich violet.

The one patch of true *australis* I have seen looked like a stiff-stemmed *hirsutus* in rich pink. *P. canescens* is taller and larger of leaf, with flowers also larger and open-mouthed, ranging in color through pink, crimson and plum purple, but sometimes a worthless pale lavender. *Brevisepalus* resembles *canescens* with the same colors, the pink being particularly pleasing. *Smalli* is an open plant of medium height, with bright green crinkled leaves and enormous bracts setting off the large flowers of pale to rich pink. The rare *dissectus* is also of medium height and stiff-stemmed with unique foliage, deeply cut like annual larkspur, and rich purple flowers. (Mr. Morrison describes this more fully on Page 23.)

A bed of these eastern species in full bloom is a sight to behold. Last summer, several of them set out in a newly constructed rock garden, in scree soil free of tree roots, fairly outdid themselves in an almost continuous display of beauty. For a Penstemon planting

in this region, I recommend devoting at least half the available space to the best color selections of these eastern species.

Species of the *glaber* group, if grown in austere scree soil, and in open sunny locations, will stand erect; but otherwise they send up long weak stems which are hopelessly beaten down in heavy rains, and cannot straighten up again. Excessive rain also tends to change normally blue flowers to insipid purple. Of these I have tried here, *subglaber* has behaved best, long-lived with good color and erect stems. *Unilateralis*, *glaber*, *speciosus*, *strictus*, *leiophyllus*, and *comarrhenus* flower well; but seldom stand straight, and usually bloom themselves to death. *Brandegei* is longer-lived, but always lies flat on the ground.

The California bedding types (*heterophyllus* and its relatives) are showy when treated like pansies, making bright patches of blue and purple, with stems nearly horizontal. *Cobaea* "Ozark" gives a great show and is long-lived, but weak-stemmed. Other species in the Aurator group, typified by *eriantherus*, are too hard to raise, and bloom for too short a period, to be worthwhile. The southwestern species (*palmeri* and its clan) are extremely difficult here, and so far I have failed to grow them to blooming size.

In the glaucous-leaved types, *nitidus* blooms well if it lives to maturity, but *angustifolius* is usually disappointing, with washed-out colors and weak stems. *Grandiflorus* and *murrayanus*, too, are usually weak-stemmed in my garden, but might do better in scree soil. I intend to try interplanting the *Fate* and *Seeba* hybrids with strong-stemmed *digitalis* to prop them up.

In the *Humiles* group, I have grown the dwarf *albertinus*, and the tall *ovatus* and *wilcoxii*. These grow easily,



Ralph W. Bennett

Penstemon digitalis

are strong-stemmed, and give us lovely blues intensified rather than weakened by rain. In the Proceri, the only one that has done well is the purple form of *whippleanus*, which makes a good show but dies immediately after blooming. Half a dozen other species have been tried from seed, but failed to reach maturity.

This is a difficult section for the shrubby species too. I have been growing *menziesi*, *cardwelli*, *barrettiae*, and *fruticosus* for five years, and have had only two plants bloom, *menziesi* and *cardwelli*, a few flowers on each. Other plants have at times looked healthy but never bloomed, and often pined away. Two other rock gardeners in the vicinity have had the same lack of success. One had a good display of flowers on *cardwelli*, but the plant never recovered from the strain. I have not yet given these species sufficient trial in screes and sandbeds, however, and have not given up hope.

Of the red-flowered Penstemons, *eatonii* is difficult to grow at all, but *barbatus* and the named hybrids such as Garnet and Firebird, and the newer "Flathead Lake," are useful for their summer color, even though they usually sprawl after heavy rains, even in scree. Together with many other Penstemons, however, they are always valuable in the cutting garden.

A Long Island Garden

ALIDA LIVINGSTON, *New York*

The experience of a very average gardener, living in a far from ideal climate, and gardening on what was once a cornfield, may dispel some of the mystery and awe associated with Penstemons. What I want in a Penstemon is color, good foliage, and—shall I say style?—these virtues combined with a

desire to live, and not too fussy habits. Of some species I have asked too much, some have asked too much of me; some are becoming old friends—and any number remain to be tried.

Chiefly I have been growing tall herbaceous species. Those native to the east coast thrive like weeds, and are uprooted like weeds. I have yet to find one really to my liking, but *P. ovatus* from the Great Plains is a stand-by. Not exacting about soil or situation, easy to raise from seed and yet long-lived, standing erect in wind or rain—*ovatus* is a species for easy enjoyment. Year after year, from ever-widening clumps of shining green leaves, its two-to-three-foot stems are covered with whorls of bright cobalt blue flowers for two weeks in June. Last year this species received an Award of Merit from the Royal Horticultural Society.

Blooming at the same time, *P. grandiflorus* is more beautiful, and less dependable. It is hardy, however, and sometimes long-lived, well worth taking trouble for even though its blossoms last but a scant ten days. (Why is *grandiflorus* recommended as a substitute for delphinium, when their only likeness is a susceptibility to crown rot?) *Murrayanus* is not always hardy here, and its long slender stems sometimes flop, yet because of its glorious combination of gray leaves and scarlet flowers, I will not give it up.

The new hybrids between *grandiflorus* and *murrayanus* brought my biggest garden thrill in many a year! I know only Mr. Fate's, but may I soon revel also in Mrs. Seeba's. Each plant sends up several graceful five-foot stems covered for $\frac{3}{4}$ of their length with long-lasting blossoms in shades of apricot, pink, coral, claret, violet, plum—all the colors found in old tapestries except yellow. The stems are dark and the leaves often have a pur-

ple glow. Many flowers open in succession for a full month's show.

I ask my assortment of *Glabri* to dress in blue rather than purple, and to keep on living. They do not always oblige. More distinguished members of the clan than *P. glaber* are *P. unilateralis* and *subglaber*—taller, their flowers less crowded on the spikes. *Subglaber* has a predilection for purple—*unilateralis* sometimes appears in the purest sky-blue. (In this connection, the experience of many growers that color and long-life are influenced by temperature and rainfall—and probably soil is also a factor. I too have suffered from blazes of magenta followed by sudden death during our too-familiar muggy spells of weather. Yet some carefully marked plants appear to possess inherent virtues. They live on and increase, and their blossoms remain the same clear blue among their fallen brethren. It is from these stalwarts I try to collect seeds and cuttings.) *Brandegei*, another of the *Glabri*, grows only to one foot here, and produces no more than five or six flowering stems. As yet I have not learned to satisfy all its wants, but I mean to try for the rest of my life. The flowers of the fringed gentian are no larger nor of a more beautiful blue!

Earlier blooming and somewhat alike are *P. nitidus*, *lentus*, and *angustifolius*—gray leaves and short spikes crowned with flowers, blue or lavender. All three are lovely, but *nitidus* is my favorite, blooming in April. Their reputation is none too good but here I have found them perennial and not unduly difficult. In red and pink tones, I have "*Flathead Lake*"—perennial and not exacting. From green mats of foliage, it sends up neat medium-tall stems with many blossoms, and I have discarded its lank, untidy relative, *P. barbatus*.

Another beauty which as yet does

not fully relish my hospitality is *P. cobaea* "Ozark." Its very large deep purple flowers open in late June, and look like Canterbury bells. Our acquaintance is of short duration, but I know it to be hardy in this region. I once beheld with unspeakable envy a long row in full bloom, the plants three years old and not one missing. And crowning injustice—they were in the garden of a lily specialist, used as a foreground for his auratums, displayed against tall trellises of clematis and all these growing in almost pure moist leafmold!

Having no rock garden, I intended passing up the little shrubs. Then came a gift plant of *P. cardwelli* to tempt me. Who could resist those shiny evergreen leaves and the big purple flowers which hide them completely in early June? So I have a wall now, from stones stolen from my neighbor's fields, and someday there will be steps too—soil pockets for the shrublets—and crevices for some of the *Proceri* whose green mats, rooting as they run, are already out of their boundaries.

So many species still to try, so much to learn about growing them! Will my old age be spent chasing will-o-the-wisp?

On the Maine Coast

GRACE F. BABB, Maine

Only four of the native eastern *Penstemons* venture north into New England—*P. hirsutus*, *digitalis*, *calycosus*, and *pallidus*. It might be supposed that the choice of other garden species would also be limited, but just the opposite seems to be true. Close to a hundred species and varieties have been tried, during the past 15 years, in my wild flower garden just outside Portland. All but a very few have been perfectly hardy as far as the winter's

ice, sleet and snow were concerned. A constant snow covering is, of course, the greatest possible help in wintering all kinds of perennials here. It is never to be depended upon in southern New England, but offers increasing cooperation further north. Its great value is shown in the fact that some Penstemons, like other perennials, will survive snowy winters in northern New England and Canada, but fail in the middle Atlantic states without snow.

Many different Penstemon species have been, from one year to another, the "Best of the Show," when all growing conditions were satisfactory. In bad years, some have sulked and lagged behind, and sometimes died, but more often the plants have waited patiently for better times to come again. The greatest hazard seems to be a wet cold spring when plants are trying to grow, and receiving no encouragement. Most of my plants have been grown from seed which is always a helpful factor in adjusting plants to a new environment.

The most spectacular blossoms are usually in the Glabri clan with their tall spikes of clustered bells. It would be hard to choose a favorite—dark blue *glaber* and *subglaber*, purplish *unilateralis*, *speciosus*, *strictus*, and *neomexicanus*, sky-blue *cyananthus* and *cyaneus*, close-clustered blue *alpinus* and *brandegei*, slender *virgatus* and airy *comarrhenus*—these have already thrilled me, and many others remain to be grown and judged. They are usually easy to grow and bloom from seed, and reasonably likely to live and bloom again. Colors are sometimes a problem, varying according to vagaries of soil or weather from good blues to less-lovely red-purples.

The gray-leaved *Coerulei* have more delicate colors of mingled pink and blue or sometimes lavender, often with

delectable pink buds. PP. *nitidus*, *angustifolius*, *acuminatus* and *congestus*—tall *grandiflorus* and its miniature twin *buckleyi*—all are enchanting and rather unpredictable, in Penstemon fashion. They may be biennial one season, and strongly perennial another, and well worth growing from seed each year. The striking red *murrayanus*, showy *cobaea*, and the thrilling new *Fate* and *Seeba* hybrids, have so far refused to winter here, or are too weakened to bloom, but these plants are more content probably in southern New England.

The eastern species are immensely valuable as border plants, and all of them give promise of being perfectly hardy here. The dignified white *digitalis* and the engaging lavender *hirsutus* have been here for many years, always pleasing and dependable. The *Gladwyne* varieties of *hirsutus* in pink and purple are especially lovely, and the darker red-purple *canescens*, and the pink or lavender *calycosus* and *smalli* seem to prove as valuable in bloom, although perhaps not as long-lived. Even the rare *dissectus* seems happily settled, but has yet to prove its entire hardiness here. From further west, *P. gracilis* in pale lavender, and *arkansanus* in dull white are reasonably hardy but not at all showy.

Rather closely related are the species grouped around *P. procerus* and *ovatus*, coming from wide-spread parts of the country, usually easy from seed, and all apparently hardy here. The tall bright blue *P. ovatus* is one of the best—dark blue, tiny-flowered *procerus*, *albertinus* and *virens* more dwarf—*tolmiei*, *aberrans* and *aridus* choice treasures for the rock garden scree. Dark purple *whippleanus* and some forms of the creamy-white *deustus* with pretty yellow buds and holly-cut foliage, are

interesting novelties, winter-hardy but perhaps not long-lived.

P. barbatus and *torreyi* are popular here as everywhere, while the hybrids such as Garnet and Firebird are satisfactory in southern New England, but have never wintered for me. The new "Flathead Lake" hybrids are much lovelier than *barbatus*, and seedlings show an interesting variation. Many west coast species such as blue *P. heterophyllus*, *azureus* and *lactus*, rosy cut-leaved *richardsoni*, lilac *diphyllus*, orange *bridgesi* and purplish *serrulatus* (*diffusus*)—all are winter-hardy and willing to bloom if grown in a warm sheltered location, protected from spring burning of their almost shrubby branches. A few other species from warm regions, such as *palmeri* and *lentus albiflorus*, have sometimes managed to survive a winter, and to bloom sparingly and unhappily before dying, showing the possibility of developing hardier races in the future. The thrilling red-flowered species, *P. cardinalis* and *eatoni*, are perfectly hardy but none too easy to grow to maturity. They are worth every care when they choose to put on their spectacular display.

The shrubby species are prodigal with bloom when just the right conditions prevail, but that is sometimes hard to arrange. They are quite easily started from seed, however, and certainly long-lived, but very susceptible here to spring foliage burning and destruction of the buds. Many do best with a northern exposure, or the protection of a boulder or taller shrub, against hot spring and summer sunshine. Many species have bloomed here in their chosen times—lavender or purple *fruticosus*, *scouleri*, *menziesi*, *cardwelli*, and *barrettiae*—dainty blue *crandalli* and *coloradoensis*, *gairdneri* hians and tiny *abietinus*, brilliant red *rupicola*, and even the rare red-tubed *pini-*

folius. Even without bloom, these dwarf evergreens retain our loyalty with their varied mats among the rocks.

Just as my own Penstemon plants vary from year to year in their performance, so do they vary in other gardens far and wide—from town to town, and state to state. No two gardeners ever have the same experiences in the same season, but the results all add up to a tremendous lot of gardening pleasure, and horticultural satisfaction.

Values

HAROLD ALBRECHT, Minnesota

Just what is the pleasure-source in growing Penstemons? It is perhaps hard to say, but one can, at least, break down some reasons. For one thing, the plant has attractive trim form, a delicate neatness which is all its own. Leaves vary from glossy green to softest pearly gray, from dull green to ash-dust gray. From out this clump comes soon the thrusting head which soars aloft quickly to the tune and rhythm of early spring breezes.

Here is a reason for appeal: the aspiration form of the stalks. It is the soaring steeple that thrusts heavenward from the prayer-house plant below. Delphiniums and digitalis, I am sure, please for the same count—flower prayer rising high to thank God for the privilege of Life.

Soon these shafts are full of opening flowers whose beauty does not belie the intriguing promise of the winsome buds. Here is their strongest point for favor, their indescribable witchery of color. Often the eye climbs upward to seek the blue of the heavens. It need not do so any longer, for here is the sky itself upon the earth. All the gamuts of blues, all the gradations from blue to lavender to pink are here, even blue-pink, pink-blue. Or we can

go from the other direction until we reach the pools of purple. But it is the blue, shimmering, sparkling blue, where I feel the flower achieves its supreme mastery. A patch of *nitidus* or *angustifolius*—even one plant of each—is breath-catching to see. Such loveliness! And how well their blue melts into harmony with the perfect foil of the leaves, “immortal music married to immortal verse.” By chance, you plant some of the Plains’ phlox nearby. Their straying prickles of green, with a snow of white or delicate blue blossoms, give an incredible ground cover. They grow so together in the West, and seem to relish being near one another here. But space will not permit for a discussion of these affinities.

Penstemons come in great variety of heights. One can begin with the wee rock garden types, and ascend the scale to good-sized bushlets. In an elevated bed which climbs gradually higher, one can have the diminutive sorts to the fore, and keep slowly mounting in size as distance progresses. Could there be a lovelier background than masses of *cobaca*, *grandiflorus* in variety, and blazing blue *glaber*?

By judicious timing of varieties, one can easily carry on for a month with the display. The very small varieties come, usually, first, and the tall later.

Big *richardsoni* will prolong the parade even a month or more beyond this. And there are others too.

Perhaps you like to play with color foils. Here there is unlimited scope. Try a dress parade of blue alone. Can there really be so many shades? Or thread the whites and blues into attractive plantings. Try pink *angustifolius* with blue *nitidus*, *angustifolius*, or *secundiflorus*, and see what happens. Can paper hope to recreate the sight of one small-sized *brandegei* plant which bore twenty-four full stalks of bloom? The open flowers, the full-swollen buds, the still-sleeping buds, all on one beautiful branch.

Be wary of criticizing a Penstemon, friends. Often you will have to retract. “I do not like *pubescens*, so wishy-washy and nondescript.” But have you ever seen a mass of it, or seen it lining the sides of a narrow brick garden-walk? Here it is sheer beauty. Sometimes a species needs mass to create the best effect. A blue *confertus* may not seem individually much, but several clumps, alight with their matchheads of blue flame, will cause you to look twice and exclaim in surprise.

You think I am too exuberant of praise? Perhaps—I apologize. I confess that I am prejudiced in favor of Penstemons. And I did not even mention the sweet *eriantherus*.

